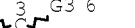

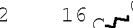


STRUCTURE SEARCH

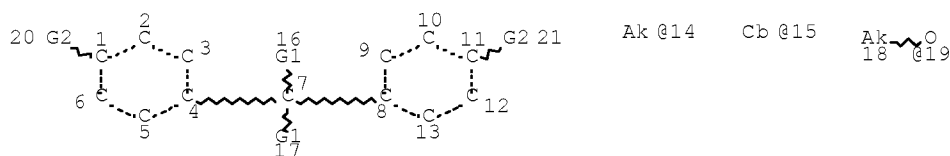
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=> d que stat 1132

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STEREO ATTRIBUTES: NONE
L38          SCR 2043 OR 1840 OR 1918 OR 1947 OR 1994 OR 2016 OR 2026
OR 2022 OR 2006
L40          278393 SEA FILE=REGISTRY SSS FUL L34 AND L7 NOT L38
L42          STR
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10/658,272-266144-EIC 1700 SEARCH



Ak @22

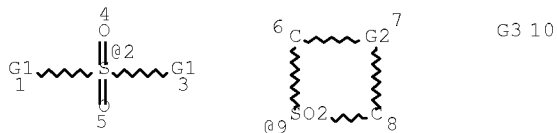
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VAR G1=14/15
VAR G2=OH/19/22
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
GGCAT IS UNS AT 15
GGCAT IS UNS AT 22
DEFAULT ECLEVEL IS LIMITED
ECOUNT IS M1-X6 C AT 14
ECOUNT IS M6-X12 C AT 15
ECOUNT IS M1-X6 C AT 18
ECOUNT IS M2-X6 C AT 22

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 22

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STEREO ATTRIBUTES: NONE
L44          SCR 1839
L45          SCR 1840 OR 2043 OR 1918
L48          3523 SEA FILE=REGISTRY SSS FUL L42 AND L44 NOT L45
L51          STR
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```

VAR G1=AK/CB
REP G2=(0-9) A
VAR G3=2/9
NODE ATTRIBUTES:
CONNECT IS E1 RC AT 4
CONNECT IS E1 RC AT 5
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 10

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STEREO ATTRIBUTES: NONE
L57          SCR 2005 AND 2021
L59          SCR 1840 OR 2043 OR 2023 OR 1947 OR 1993 OR 2016 OR 2026
L61      45053 SEA FILE=REGISTRY SSS FUL L51 AND L57 NOT L59
L63          1 SEA FILE=REGISTRY ABB=ON  PLU=ON  80-05-7/RN
L65          1 SEA FILE=REGISTRY ABB=ON  PLU=ON  L2 AND ?PYRROL?/CNS
L66          1 SEA FILE=REGISTRY ABB=ON  PLU=ON  271-89-6/RN
L67          1 SEA FILE=REGISTRY ABB=ON  PLU=ON  693-98-1/RN
L68      180074 SEA FILE=HCAPLUS ABB=ON  PLU=ON  "SECONDARY BATTERIES"+
MAX/CT
```

10/658,272-266144-EIC 1700 SEARCH

| | | |
|------|--------|---|
| L69 | 85408 | SEA FILE=HCAPLUS ABB=ON PLU=ON BATTER?(2A) (SECONDAR? |
| | | OR LITHIUM) |
| L70 | 199825 | SEA FILE=HCAPLUS ABB=ON PLU=ON L68 OR L69 |
| L71 | 52300 | SEA FILE=HCAPLUS ABB=ON PLU=ON LITHIUM(2A) (SALT OR |
| | | HALIDE OR ELECTROLYTE OR CATION OR ION) |
| L72 | | QUE ABB=ON PLU=ON ELECTROD?(2A) POSITIVE OR CATHOD? |
| L73 | | QUE ABB=ON PLU=ON SOLVENT?(2A) (ORGANIC OR NONAQUEOUS |
| | | OR NON(W) AQUEOUS) |
| L74 | 90575 | SEA FILE=REGISTRY ABB=ON PLU=ON L40 AND 1/NR |
| L76 | 186965 | SEA FILE=REGISTRY ABB=ON PLU=ON L40 AND 2/NR |
| L77 | 155844 | SEA FILE=REGISTRY ABB=ON PLU=ON L76 AND 1-99/N |
| L78 | 147343 | SEA FILE=REGISTRY ABB=ON PLU=ON L76 AND 1-99/O |
| L79 | 119040 | SEA FILE=REGISTRY ABB=ON PLU=ON L77 AND L78 |
| L80 | 63851 | SEA FILE=REGISTRY ABB=ON PLU=ON L76 AND 1-99/S |
| L81 | 37023 | SEA FILE=REGISTRY ABB=ON PLU=ON L79 AND L80 |
| L82 | 82017 | SEA FILE=REGISTRY ABB=ON PLU=ON L79 NOT L81 |
| L83 | 41097 | SEA FILE=REGISTRY ABB=ON PLU=ON L76 NOT (L80 OR L81 |
| | | OR L82) |
| L84 | 580816 | SEA FILE=HCAPLUS ABB=ON PLU=ON L74 OR L80 OR L81 OR |
| | | L82 OR L83 |
| L85 | 26032 | SEA FILE=HCAPLUS ABB=ON PLU=ON L48 |
| L86 | 5406 | SEA FILE=HCAPLUS ABB=ON PLU=ON L70 AND (L84 OR L85) |
| L87 | 628 | SEA FILE=HCAPLUS ABB=ON PLU=ON L86 AND L71 AND L73 |
| L88 | 257 | SEA FILE=HCAPLUS ABB=ON PLU=ON L87 AND L72 |
| L89 | 15 | SEA FILE=REGISTRY ABB=ON PLU=ON L2 AND 1-9/LI |
| L92 | 1 | SEA FILE=REGISTRY ABB=ON PLU=ON 7439-93-2/RN |
| L93 | 11 | SEA FILE=REGISTRY ABB=ON PLU=ON L89 NOT (L92 OR |
| | | TIS/CI) |
| L95 | | QUE ABB=ON PLU=ON L93 |
| L96 | 207 | SEA FILE=HCAPLUS ABB=ON PLU=ON L88 AND L95 |
| L97 | | QUE ABB=ON PLU=ON L61 |
| L98 | 29 | SEA FILE=HCAPLUS ABB=ON PLU=ON L96 AND L97 |
| L99 | 288810 | SEA FILE=HCAPLUS ABB=ON PLU=ON PASSIVATION+MAX/CT |
| L101 | 1 | SEA FILE=HCAPLUS ABB=ON PLU=ON L99 AND L88 |
| L102 | 54756 | SEA FILE=HCAPLUS ABB=ON PLU=ON PASSIVAT? |
| L103 | | QUE ABB=ON PLU=ON FILM? OR THINFILM? OR LAYER? OR OV |
| | | ERLAY? OR OVERLAID? OR LAMIN? OR LAMEL? OR MULTILAYER? |
| | | OR SHEET? OR LEAF? OR FOIL? OR COAT? OR TOPCOAT? OR OVE |
| | | RCOAT? OR VENEER? OR SHEATH? OR COVER? OR ENVELOP? OR E |
| | | NCASE? OR ENWRAP? OR OVERSPREAD? OR ENCAPSUL? |
| L104 | 18876 | SEA FILE=HCAPLUS ABB=ON PLU=ON L102(3A) L103 |
| L105 | 299911 | SEA FILE=HCAPLUS ABB=ON PLU=ON L99 OR L104 |
| L106 | 3 | SEA FILE=HCAPLUS ABB=ON PLU=ON L105 AND L88 |
| L107 | 10 | SEA FILE=HCAPLUS ABB=ON PLU=ON L105 AND L87 |
| L108 | 10 | SEA FILE=HCAPLUS ABB=ON PLU=ON L101 OR L106 OR L107 |
| L109 | 72122 | SEA FILE=HCAPLUS ABB=ON PLU=ON L63 OR BISPHENOL A |
| L110 | 46 | SEA FILE=HCAPLUS ABB=ON PLU=ON L65 AND PHENYLSULFONYL |
| | | (A) PYRROLE |
| L111 | 2580 | SEA FILE=HCAPLUS ABB=ON PLU=ON L66 OR PHENYLSULFONYL(|
| | | A) PYRROLE |
| L112 | 14059 | SEA FILE=HCAPLUS ABB=ON PLU=ON L67 OR BENZOFURAN |
| L113 | 16109 | SEA FILE=HCAPLUS ABB=ON PLU=ON L63 OR BUTYLBENZOFURAN |
| L114 | 869 | SEA FILE=HCAPLUS ABB=ON PLU=ON L65 OR THIANAPHTHENE |
| L115 | 15128 | SEA FILE=HCAPLUS ABB=ON PLU=ON L67 OR METHYLIMIDAZOLE |
| | | OR METHYL(W) IMIDAZOLE |
| L116 | 4607 | SEA FILE=HCAPLUS ABB=ON PLU=ON L70 AND L73 |
| L117 | 31 | SEA FILE=HCAPLUS ABB=ON PLU=ON L116 AND ((L109 OR |
| | | L110 OR L111 OR L112 OR L113 OR L114 OR L115)) |
| L118 | 10 | SEA FILE=HCAPLUS ABB=ON PLU=ON L117 AND L95 |
| L119 | 11 | SEA FILE=HCAPLUS ABB=ON PLU=ON L117 AND L71 |
| L120 | 1 | SEA FILE=HCAPLUS ABB=ON PLU=ON L118 AND L105 |
| L121 | 5 | SEA FILE=HCAPLUS ABB=ON PLU=ON L117 AND L97 |
| L122 | 0 | SEA FILE=HCAPLUS ABB=ON PLU=ON L98 AND L105 |
| L123 | 5 | SEA FILE=HCAPLUS ABB=ON PLU=ON L117 AND L97 |
| L124 | 73077 | SEA FILE=HCAPLUS ABB=ON PLU=ON L109 OR L113 OR L114 |
| L125 | 24 | SEA FILE=HCAPLUS ABB=ON PLU=ON L124 AND L116 |

10/658,272-266144-EIC 1700 SEARCH

L126 10 SEA FILE=HCAPLUS ABB=ON PLU=ON L125 AND (L71 OR L72
 OR L95 OR L105)
L127 51 SEA FILE=HCAPLUS ABB=ON PLU=ON L98 OR L108 OR (L118
 OR L119 OR L120 OR L121 OR L122 OR L123) OR L126
L128 777304 SEA FILE=HCAPLUS ABB=ON PLU=ON ELECTROCHEM?/SC,SX
L129 48 SEA FILE=HCAPLUS ABB=ON PLU=ON L127 AND L128
L130 33 SEA FILE=HCAPLUS ABB=ON PLU=ON L129 AND L72
L131 QUE ABB=ON PLU=ON PY<2004 OR PRY<2004 OR AY<2004 OR
 MY<2004 OR REVIEW/DT
L132 27 SEA FILE=HCAPLUS ABB=ON PLU=ON L130 AND L131

10/658,272-266144-EIC 1700 SEARCH

STRUCTURE SEARCH RESULTS

=> d l132 1-27 ibib ed abs hitstr hitind

L132 ANSWER 1 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2005:394067 HCAPLUS Full-text
 DOCUMENT NUMBER: 142:433100
 TITLE: Lithium battery having effective performance
 INVENTOR(S): Kim, Kwang-Chun; Kim, Jin-Sung; Song, Min-Ho; Yoon, Jang-Ho; Kwon, Teak-Hyen; Lee, Jin-Uk; Kim, Chang-Seob
 PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
 SOURCE: Eur. Pat. Appl., 14 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

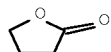
| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|------|----------|------------------|-------------------|
| EP 1528617 | A2 | 20050504 | EP 2004-256676 | 2004 1028 |
| <-- | | | | |
| EP 1528617 | A3 | 20061004 | | |
| EP 1528617 | B1 | 20080709 | | |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR | | | | |
| KR 2005040974 | A | 20050504 | KR 2003-75821 | 2003 1029 |
| <-- | | | | |
| JP 2005135895 | A | 20050526 | JP 2004-181365 | 2004 0618 |
| <-- | | | | |
| JP 4012174 | B2 | 20071121 | | |
| US 20050095507 | A1 | 20050505 | US 2004-938538 | 2004 0913 |
| <-- | | | | |
| US 7078132 | B2 | 20060718 | | |
| CN 1612383 | A | 20050504 | CN 2004-10088037 | 2004 1029 |
| <-- | | | | |
| PRIORITY APPLN. INFO.: | | | KR 2003-75821 | A 2003 1029 |
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ED Entered STN: 09 May 2005

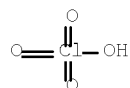
AB A lithium battery has an anode, a cathode having a compound capable of intercalating and deintercalating lithium, a separator interposed between the cathode and the anode, and an electrolyte solution having an electrolyte solute dissolved in a nonaq. solvent. The nonaq. solvent includes a mixed solvent containing 8 to 15% by volume of ethylene carbonate, 10 to 35% by volume of γ -butyrolactone, 35 to 65% by volume of at least one linear carbonate selected from the group consisting of di-Me carbonate, di-Et carbonate, ethylmethyl carbonate, methylpropyl carbonate, ethylpropyl carbonate and methylbutyl carbonate and 8 to 15% by volume of fluorobenzene, and 0.5 to 9 parts by volume of vinylene carbonate based on 100 parts by volume of the mixed solvent. The nonaq. solvent may further include 0.05 to 5 parts by volume of vinyl sulfone, isooxazole or a mixture thereof based on 100 parts by volume of the mixed solvent.

10/658,272-266144-EIC 1700 SEARCH

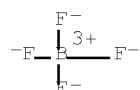
IT 96-48-0, γ -Butyrolactone 7791-03-9,
 Lithium perchlorate 14283-07-9, Lithium
 tetrafluoroborate 21324-40-3, Lithium
 hexafluorophosphate 29935-35-1, Lithium
 hexafluoroarsenate 33454-82-9, Lithium
 triflate 90076-65-6 131651-65-5,
 Lithium nonafluorobutanesulfonate
 RL: DEV (Device component use); USES (Uses)
 (lithium battery having effective
 performance)
 RN 96-48-0 HCAPLUS
 CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



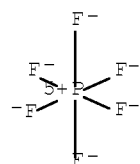
RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



RN 14283-07-9 HCAPLUS
 CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



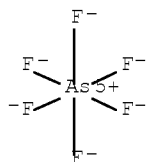
RN 21324-40-3 HCAPLUS
 CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



10/658,272-266144-EIC 1700 SEARCH

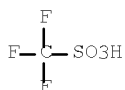
RN 29935-35-1 HCAPLUS

CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



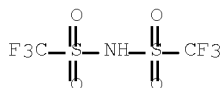
RN 33454-82-9 HCAPLUS

CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



RN 131651-65-5 HCAPLUS

CN 1-Butanesulfonic acid, 1,1,2,2,3,3,4,4,4-nonafluoro-, lithium salt (1:1) (CA INDEX NAME)



IT 77-77-0, Vinyl sulfone 872-36-6, Vinylene carbonate

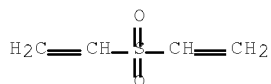
RL: MOA (Modifier or additive use); USES (Uses)

10/658,272-266144-EIC 1700 SEARCH

(lithium battery having effective performance)

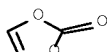
RN 77-77-0 HCAPLUS

CN Ethene, 1,1'-sulfonylbis- (CA INDEX NAME)



RN 872-36-6 HCAPLUS

CN 1,3-Dioxol-2-one (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium battery effective performance

IT Battery electrolytes

Swelling, physical

(lithium battery having effective performance)

IT Carbonaceous materials (technological products)

RL: DEV (Device component use); USES (Uses)

(lithium battery having effective performance)

IT Transition metal oxides

RL: DEV (Device component use); USES (Uses)

(lithium-containing; lithium battery having effective performance)

IT Secondary batteries

(lithium; lithium battery having effective performance)

IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 4437-70-1, 2,3-Butylene carbonate 4437-85-8, 1,2-Butylene carbonate 4437-86-9 4824-75-3, Butyl methyl carbonate 7704-34-9, Sulfur, uses 7704-34-9D, Sulfur, compound 7791-03-9, Lithium perchlorate 12017-96-8, Chromium lithium oxide (CrLiO₂) 12031-65-1, Lithium nickel oxide (LiNiO₂) 12057-17-9, Lithium manganese oxide (LiMn₂O₄) 12162-79-7, Lithium manganese oxide limno₂ 12190-79-3, Cobalt lithium oxide (CoLiO₂) 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate, uses 56525-42-9, Methyl propyl carbonate, uses 89489-56-5 90076-65-6 131651-65-5, Lithium nonafluorobutanesulfonate
RL: DEV (Device component use); USES (Uses)
(lithium battery having effective performance)

IT 77-77-0, Vinyl sulfone 288-14-2, Isoxazole 462-06-6, Fluorobenzene 872-36-6, Vinylene carbonate

RL: MOA (Modifier or additive use); USES (Uses)

(lithium battery having effective performance)

10/658,272-266144-EIC 1700 SEARCH

performance)

L132 ANSWER 2 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2004:857017 HCAPLUS Full-text
 DOCUMENT NUMBER: 141:352733
 TITLE: Low temperature electrochemical cells
 INVENTOR(S): Mikhaylik, Yuriy V.
 PATENT ASSIGNEE(S): Moltech Corporation, USA
 SOURCE: U.S. Pat. Appl. Publ., 12 pp.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|----------------|------|----------|-----------------|--------------|
| US 20040202936 | A1 | 20041014 | US 2003-411999 | 2003 0410 |
| US 7189477 | B2 | 20070313 | US 2003-411999 | 2003 0410 |

PRIORITY APPLN. INFO.: <--

ED Entered STN: 18 Oct 2004

AB Disclosed is an electrochem. cell comprising a lithium anode and a sulfur-containing cathode and a nonaq. electrolyte solvent. In the fully charged state of the cell the concentration of lithium ions is preferably less than 0.3M. The cell delivers high discharge capacity at discharge rates, for example, C/5, over temps. ranges of from +25° to -20°. Also disclosed is a battery including an electrochem. cell according to the invention and a device that utilizes such a battery to derive power.

IT 77-79-2, 3-Sulfolene 96-47-9, 2-Methyltetrahydrofuran 109-99-9, Thf, uses 126-33-0, Sulfolane 872-93-5, 3-Methylsulfolane 33454-82-9, Lithium triflate 90076-65-6
 RL: DEV (Device component use); USES (Uses)
 (low-temperature electrochem. cells)

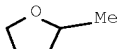
RN 77-79-2 HCAPLUS

CN Thiophene, 2,5-dihydro-, 1,1-dioxide (CA INDEX NAME)



RN 96-47-9 HCAPLUS

CN Furan, tetrahydro-2-methyl- (CA INDEX NAME)



RN 109-99-9 HCAPLUS

CN Furan, tetrahydro- (CA INDEX NAME)

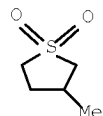
10/658,272-266144-EIC 1700 SEARCH



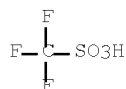
RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



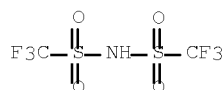
RN 872-93-5 HCAPLUS
CN Thiophene, tetrahydro-3-methyl-, 1,1-dioxide (CA INDEX NAME)



RN 33454-82-9 HCAPLUS
CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



IC ICM H01M004-58
ICS H01M006-16
INCL 429231900; 429231950; 429333000; 429335000; 429338000; 429342000;
429331000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy)

10/658,272-266144-EIC 1700 SEARCH

Technology)

Section cross-reference(s): 72

IT Electrochemical cells

Secondary batteries

(low-temperature electrochem. cells)

IT 60-29-7, Diethyl ether, uses 77-79-2, 3-Sulfolene

96-47-9, 2-Methyltetrahydrofuran 109-87-5,

Dimethoxymethane 109-99-9, Thf, uses 111-43-3,

Dipropyl ether 111-96-6, Diethylene glycol dimethyl ether

112-49-2, Triethylene glycol dimethyl ether 123-91-1,

1,4-Dioxane, uses 126-33-0, Sulfolane 142-68-7,

Tetrahydropyran 142-96-1, Dibutyl ether 143-24-8,

Tetraethylene glycol dimethyl ether 149-73-5, Trimethoxymethane

462-95-3, Diethoxymethane 505-22-6, 1,3-Dioxane 556-65-0,

Lithium thiocyanate 646-06-0, 1,3-Dioxolane 372-93-5,

3-Methylsulfolane 1634-04-4, Methyl tert-butyl ether

7439-93-2, Lithium, uses 7439-93-2D, Lithium,

salt 7704-34-9, Sulfur, uses 7704-34-9D, Sulfur,

compound 17081-21-9, 1,3-Dimethoxypropane 33454-82-9,

Lithium triflate 90076-65-6 111109-77-4, Dipropylene

glycol dimethyl ether

RL: DEV (Device component use); USES (Uses)

(low-temperature electrochem. cells)

REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

L132 ANSWER 3 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:753254 HCAPLUS Full-text

DOCUMENT NUMBER: 141:228183

TITLE: A nonaqueous electrolyte for
lithium secondary
battery

INVENTOR(S): Kim, Jin-Hee; Kim, Jin-Sung; Hwang, Sang-Moon;
Paik, Meen-Seon; Kim, Hak-Soo

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea; Cheil
Industries Inc.

SOURCE: Eur. Pat. Appl., 33 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|------|----------|-----------------|--------------|
| ----- | ---- | ----- | ----- | |
| EP 1458048 | A1 | 20040915 | EP 2003-90262 | 2003 0821 |
| <-- | | | | |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK | | | | |
| KR 2004080775 | A | 20040920 | KR 2003-15749 | 2003 0313 |
| <-- | | | | |
| JP 2005108439 | A | 20050421 | JP 2003-183239 | 2003 0626 |
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| CN 1531134 | A | 20040922 | CN 2003-155332 | 2003 0827 |
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| US 20040185347 | A1 | 20040923 | US 2003-658272 | |

10/658,272-266144-EIC 1700 SEARCH

2003

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PRIORITY APPLN. INFO.:

<--
KR 2003-15749

A

2003

0313

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OTHER SOURCE(S): MARPAT 141:228183

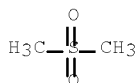
ED Entered STN: 16 Sep 2004

AB An electrolyte for a lithium secondary battery includes lithium salts, a nonaq. organic solvent, and additive compds. The additive compds. added to the electrolyte of the present invention decompose earlier than the organic solvent to form a conductive polymer layer on the surface of a pos. electrode, and prevent decomposition of the organic solvent. Accordingly, the electrolyte inhibits gas generation caused by decomposition of the organic solvent at initial charging, and thus reduces an increase of internal pressure and swelling during high temperature storage, and also improves safety of the battery during overcharge.

IT 67-71-0, Methylsulfone 77-77-0, Vinylsulfone
126-33-0, Tetramethylene sulfone 127-63-9,
Phenylsulfone 1839-59-4, Ethylvinylsulfone
3680-02-2, Methylvinylsulfone 5535-43-3,
m-ChloroPhenyl vinyl sulfone 5535-48-8,
Phenylvinylsulfone 7447-41-3, Lithium chloride (LiCl),
uses 7791-03-9, Lithium perchlorate
10377-51-2, Lithium iodide 14024-11-4,
Aluminum lithium chloride AlLiCl_4 14283-07-9,
Lithium tetrafluoroborate 18424-17-4,
Lithium hexafluoroantimonate 21324-40-3,
Lithium hexafluorophosphate 28122-14-7,
p-FluoroPhenyl vinyl sulfone 28452-93-9, Butadiene
sulfone 29935-35-1, Lithium hexafluoroarsenate
33454-82-9, Lithium triflate 90076-65-6
131651-65-5, Lithium nonafluorobutanesulfonate
RL: DEV (Device component use); USES (Uses)
(nonaq. electrolyte for lithium
secondary battery)

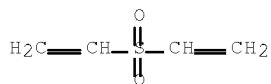
RN 67-71-0 HCAPLUS

CN Methane, 1,1'-sulfonylbis- (CA INDEX NAME)



RN 77-77-0 HCAPLUS

CN Ethene, 1,1'-sulfonylbis- (CA INDEX NAME)

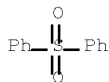


RN 126-33-0 HCAPLUS

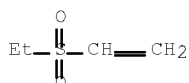
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



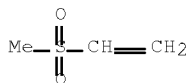
RN 127-63-9 HCAPLUS
 CN Benzene, 1,1'-sulfonylbis- (CA INDEX NAME)



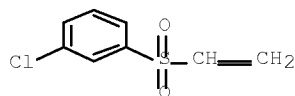
RN 1889-59-4 HCAPLUS
 CN Ethene, (ethylsulfonyl)- (CA INDEX NAME)



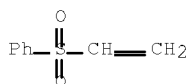
RN 3680-02-2 HCAPLUS
 CN Ethene, (methylsulfonyl)- (CA INDEX NAME)



RN 5535-43-3 HCAPLUS
 CN Benzene, 1-chloro-3-(ethenylsulfonyl)- (CA INDEX NAME)



RN 5535-48-8 HCAPLUS
 CN Benzene, (ethenylsulfonyl)- (CA INDEX NAME)



RN 7447-41-8 HCAPLUS

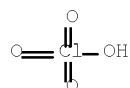
10/658,272-266144-EIC 1700 SEARCH

CN Lithium chloride (LiCl) (CA INDEX NAME)



RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



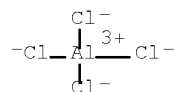
RN 10377-51-2 HCAPLUS

CN Lithium iodide (LiI) (CA INDEX NAME)



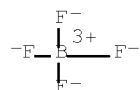
RN 14024-11-4 HCAPLUS

CN Aluminate(1-), tetrachloro-, lithium (1:1), (T-4)- (CA INDEX NAME)



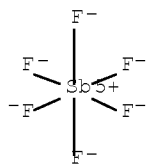
RN 14283-07-9 HCAPLUS

CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)

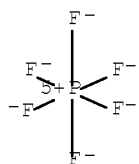


RN 18424-17-4 HCAPLUS

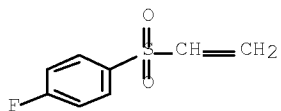
CN Antimonate(1-), hexafluoro-, lithium (1:1), (OC-6-11)- (CA INDEX NAME)



RN 21324-40-3 HCAPLUS
 CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



RN 28122-14-7 HCAPLUS
 CN Benzene, 1-(ethenylsulfonyl)-4-fluoro- (CA INDEX NAME)



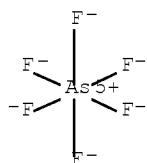
RN 28452-93-9 HCAPLUS
 CN Thiophene, dihydro-, 1,1-dioxide (CA INDEX NAME)

CM 1

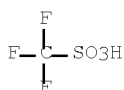
CRN 126-33-0
 CMF C4 H8 O2 S



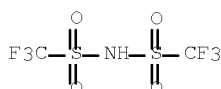
RN 29935-35-1 HCAPLUS
 CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



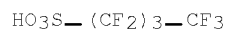
RN 33454-82-9 HCAPLUS
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



RN 131651-65-5 HCAPLUS
 CN 1-Butanesulfonic acid, 1,1,2,2,3,3,4,4,4-nonafluoro-, lithium salt (1:1) (CA INDEX NAME)



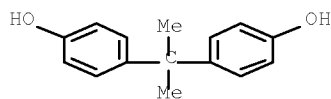
IT 80-05-7, Bisphenol A, uses
 95-15-8, Thianaphthene 271-89-6, 2,3-Benzofuran 625-86-5, 2,5-Dimethylfuran 693-98-1, 2-Methylimidazole 1192-62-7, 2-Acetylfuran 1193-79-9, 2-Acetyl-5-methylfuran 4265-27-4, 2-Butylbenzofuran 16851-82-4, 1-(Phenylsulfonyl)pyrrole
 RL: MOA (Modifier or additive use); USES (Uses)

10/658,272-266144-EIC 1700 SEARCH

(nonaq. electrolyte for lithium
secondary battery)

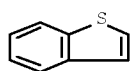
RN 80-05-7 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis- (CA INDEX NAME)



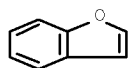
RN 95-15-8 HCAPLUS

CN Benzo[b]thiophene (CA INDEX NAME)



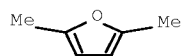
RN 271-89-6 HCAPLUS

CN Benzofuran (CA INDEX NAME)



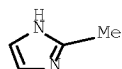
RN 625-86-5 HCAPLUS

CN Furan, 2,5-dimethyl- (CA INDEX NAME)



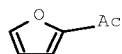
RN 693-98-1 HCAPLUS

CN 1H-Imidazole, 2-methyl- (CA INDEX NAME)



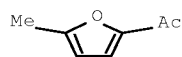
RN 1192-62-7 HCAPLUS

CN Ethanone, 1-(2-furanyl)- (CA INDEX NAME)

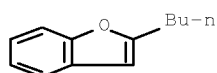


10/658,272-266144-EIC 1700 SEARCH

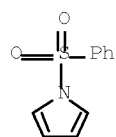
RN 1193-79-9 HCAPLUS
CN Ethanone, 1-(5-methyl-2-furanyl)- (CA INDEX NAME)



RN 4265-27-4 HCAPLUS
CN Benzofuran, 2-butyl- (CA INDEX NAME)



RN 16851-82-4 HCAPLUS
CN 1H-Pyrrole, 1-(phenylsulfonyl)- (CA INDEX NAME)



IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST nonaq electrolyte lithium secondary battery; safety nonaq electrolyte lithium secondary battery
IT Secondary batteries
(lithium; nonaq. electrolyte for lithium secondary battery)
IT Battery electrolytes
Conducting polymers
Safety
Swelling, physical
(nonaq. electrolyte for lithium secondary battery)
IT Aromatic hydrocarbons, uses
Esters, uses
Ethers, uses
Ketones, uses
RL: DEV (Device component use); USES (Uses)
(nonaq. electrolyte for lithium secondary battery)
IT Lithium alloy, base
RL: DEV (Device component use); USES (Uses)
(nonaq. electrolyte for lithium secondary battery)
IT 67-71-0, Methylsulfone 71-43-2, Benzene, uses
77-77-0, Vinylsulfone 96-49-1, Ethylene carbonate

10/658,272-266144-EIC 1700 SEARCH

105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate
 108-88-3, Toluene, uses 126-33-0, Tetramethylene sulfone
 127-63-9, Phenylsulfone 462-06-6, Fluorobenzene
 463-79-6D, Carbonic acid, chain ester 463-79-6D, Carbonic acid,
 cyclic ester 463-79-6D, Carbonic acid, ester 616-38-6,
 Dimethyl carbonate 620-32-6, Benzylsulfone 623-53-0, Methyl
 ethyl carbonate 623-96-1, Dipropyl carbonate 1330-20-7,
 Xylene, uses 1889-59-4, Ethylvinylsulfone
 3680-02-2, Methylvinylsulfone 4437-85-8, Butylene
 carbonate 5535-43-3, m-ChloroPhenyl vinyl sulfone
 5535-48-8, Phenylvinylsulfone 7439-93-2, Lithium
 , uses 7447-41-8, Lithium chloride (LiCl), uses
 7791-03-9, Lithium perchlorate
 10377-51-2, Lithium iodide 14024-11-4,
 Aluminum lithium chloride AlLiCl4 14283-07-9,
 Lithium tetrafluoroborate 18424-17-4,
 Lithium hexafluoroantimonate 21324-40-3,
 Lithium hexafluorophosphate 27359-10-0, Trifluorotoluene
 28122-14-7, p-FluoroPhenyl vinyl sulfone
 28452-93-9, Butadiene sulfone 29935-35-1,
 Lithium hexafluoroarsenate 33454-82-9,
 Lithium triflate 35363-40-7, Ethyl propyl carbonate,
 uses 37220-89-6, Aluminum lithium oxide 39300-70-4,
 Lithium nickel oxide 56525-42-9, Methyl propyl carbonate, uses
 90076-65-6 131651-65-5, Lithium
 nonafluorobutanesulfonate 162684-16-4, Lithium manganese nickel
 oxide

RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte for lithium
 secondary battery)

IT 80-05-7, Bisphenol A, uses
 95-15-8, Thianaphthene 117-80-6,
 2,3-Dichloro-1,4-naphthoquinone 271-89-6, 2,3-
 Benzofuran 524-42-5, 1,2-Naphthoquinone 625-36-5
 , 2,5-Dimethylfuran 693-98-1, 2-Methylimidazole
 1192-62-7, 2-Acetylfuran 1193-79-9,
 2-Acetyl-5-methylfuran 4265-27-4, 2-
 Butylbenzofuran 7474-83-1, 3-Bromo-1,2-naphthoquinone
 13243-65-7, 2,3-Dibromo-1,4-naphthoquinone 16851-82-4,
 1-(Phenylsulfonyl)pyrrole

RL: MOA (Modifier or additive use); USES (Uses)
 (nonaq. electrolyte for lithium
 secondary battery)

REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE
 FOR THIS RECORD. ALL CITATIONS AVAILABLE
 IN THE RE FORMAT

L132 ANSWER 4 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:493237 HCAPLUS Full-text

DOCUMENT NUMBER: 141:40710

TITLE: Organic electrolyte solution for
 secondary lithium sulfur
 battery and the battery using the
 solution

INVENTOR(S): Kim, Ju-yup; Lee, Suk-su; Yoo, Yoon-kyun; Cho,
 Myung-dong

PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea

SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------|------|-------|-----------------|-------|
| ----- | ---- | ----- | ----- | ----- |
| ----- | | | | |

10/658,272-266144-EIC 1700 SEARCH

JP 2004172126 A 20040617 JP 2003-387193 2003
1117

<--
KR 2004043226 A 20040524 KR 2002-71395 2002
1116

<--
US 20040157132 A1 20040812 US 2003-694815 2003
1029

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CN 1501543 A 20040602 CN 2003-10103670 2003
1111

<--
PRIORITY APPLN. INFO.: KR 2002-71395 A 2002
1116

ED Entered STN: 18 Jun 2004

AB The electrolyte solution comprises a Li salt and an organic solvent mixture; where the solvent mixture contains a compound of the formula R1(CH2)3R2 [R1 and R2 = halo, OH, (substituted) C1-20 alkyl, (substituted) C1-20 alkoxy, (substituted) C6-30 allyl; (substituted) C6-30 allyl alkyl; (substituted) C6-30 allyloxy, (substituted) C2-30 heteroallyl alkyl, (substituted) C2-30 heteroallyloxy, (substituted) C5-20 cycloalkyl, or (substituted) C5-20 heterocycloalkyl group] or its isomer. The battery has a cathode, containing S or a S compound; an anode; a separator between the cathode and the anode; and the above electrolyte solution

IT 126-33-0, Sulfolane 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6
RL: DEV (Device component use); USES (Uses)
(organic electrolyte solns. containing dialkoxy propane compds. in solvents for secondary lithium sulfur batteries)

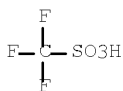
RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 33454-82-9 HCAPLUS

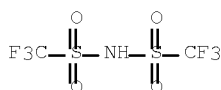
CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



● Li

IC ICM H01M010-40
ICS H01M004-38; H01M004-58; H01M004-60
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary battery org electrolyte
solvent dialkoxy propane compd
IT Secondary batteries
(lithium; organic electrolyte solns. containing dialkoxy propane compds. in solvents for secondary lithium sulfur batteries)
IT Battery electrolytes
(organic electrolyte solns. containing dialkoxy propane compds. in solvents for secondary lithium sulfur batteries)
IT 111-96-6, Diethylene glycol dimethyl ether 126-33-0, Sulfolane 646-06-0, Dioxolane 7439-93-2D, Lithium, salts 7704-34-9, Sulfur, uses 9002-88-4, Polyethylene 17081-21-9, 1,3-Dimethoxy propane 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6
RL: DEV (Device component use); USES (Uses)
(organic electrolyte solns. containing dialkoxy propane compds. in solvents for secondary lithium sulfur batteries)

L132 ANSWER 5 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2003:435148 HCAPLUS Full-text

DOCUMENT NUMBER: 138:388239

TITLE: In situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochemical cells

INVENTOR(S): Xing, Weibing; Takeuchi, Esther S.

PATENT ASSIGNEE(S): USA

SOURCE: U.S. Pat. Appl. Publ., 9 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|----------------|------|----------|-----------------|--------------|
| ----- | ---- | ----- | ----- | |
| US 20030104282 | A1 | 20030605 | US 2001-883 | 2001 1115 |

PRIORITY APPLN. INFO.: <-- US 2001-883

2001
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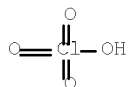
ED Entered STN: 06 Jun 2003

AB A single step, in situ curing method for making gel polymer lithium ion rechargeable cells and batteries is disclosed. This method used a precursor solution consisting of monomers with multiple functionalities such as multiple acryloyl functionalities, a free-radical generating activator, nonaq. solvents such as ethylene carbonate and

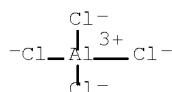
10/658,272-266144-EIC 1700 SEARCH

propylene carbonate, and a lithium salt such as LiPF₆. The electrodes are prepared by slurry-coating a carbonaceous material such as graphite onto an anode current collector and a lithium transition metal oxide such as LiCoO₂ onto a cathode current collector, resp. The electrodes, together with a highly porous separator, are then soaked with the polymer electrolyte precursor solution and sealed in a cell package under vacuum. The whole cell package is heated to in situ cure the polymer electrolyte precursor. The resulting lithium ion rechargeable cells with gelled polymer electrolyte demonstrate excellent electrochem. properties such as high efficiency in material utilization, high Coulombic efficiency, good rate capability, and good cyclability.

IT 7791-03-9, Lithium perchlorate 14024-11-4,
Lithium tetrachloroaluminate 14283-07-9, Lithium
tetrafluoroborate 18424-17-4, Lithium
hexafluoroantimonate 21324-40-3, Lithium
hexafluorophosphate 29935-35-1, Lithium
hexafluoroarsenate 33454-82-9, Lithium triflate
90076-65-6
RL: DEV (Device component use)
(in-situ thermal polymerization method for making gel polymer
lithium ion rechargeable electrochem. cells)
RN 7791-03-9 HCAPLUS
CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



RN 14024-11-4 HCAPLUS
CN Aluminate(1-), tetrachloro-, lithium (1:1), (T-4)- (CA INDEX NAME)

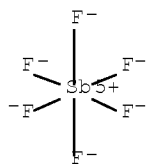


RN 14283-07-9 HCAPLUS
CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



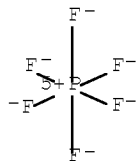
RN 18424-17-4 HCAPLUS
CN Antimonate(1-), hexafluoro-, lithium (1:1), (OC-6-11)- (CA INDEX NAME)

NAME)



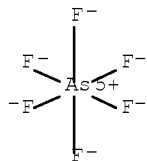
RN 21324-40-3 HCAPLUS

CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



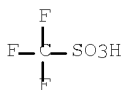
RN 29935-35-1 HCAPLUS

CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



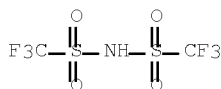
RN 33454-82-9 HCAPLUS

CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



10/658,272-266144-EIC 1700 SEARCH

RN 90076-65-6 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-
 , lithium salt (1:1) (CA INDEX NAME)



IC ICM H01M010-40
 ICS H01M004-58; H01M004-66
 INCL 429303000; 429189000; 429231800; 429245000; 429231100; 029623100
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)
 Section cross-reference(s): 38
 ST lithium battery gel polymer electrolyte in
 situ thermal polymn
 IT Battery electrolytes
 (in-situ thermal polymerization method for making gel polymer
 lithium ion rechargeable electrochem. cells)
 IT Carbon black, uses
 Coke
 RL: DEV (Device component use)
 (in-situ thermal polymerization method for making gel polymer
 lithium ion rechargeable electrochem. cells)
 IT Secondary batteries
 (lithium; in-situ thermal polymerization method
 for making gel polymer lithium ion
 rechargeable electrochem. cells)
 IT Polymerization
 (thermal; in-situ thermal polymerization method for making gel polymer
 lithium ion rechargeable electrochem. cells)
 IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 7440-06-4,
 Platinum, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium,
 uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses
 11101-13-6 12597-68-1, Stainless steel, uses
 RL: DEV (Device component use)
 (anode current collector; in-situ thermal polymerization method for
 making gel polymer lithium ion rechargeable
 electrochem. cells)
 IT 7440-44-0, Carbon, uses
 RL: DEV (Device component use)
 (glassy; in-situ thermal polymerization method for making gel polymer
 lithium ion rechargeable electrochem. cells)
 IT 94-36-0, Benzoyl peroxide, processes 105-74-8, Lauroyl peroxide
 2094-98-6, 1,1'-Azobis(cyclohexanecarbonitrile) 2638-94-0,
 4,4'-Azobis(4-cyanovaleric acid) 3006-86-8, 1,1-Bis(tert-
 butylperoxy)cyclohexane 15667-10-4, 1,1-Bis(tert-
 amylperoxy)cyclohexane
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical
 process); PROC (Process)
 (in-situ thermal polymerization method for making gel polymer
 lithium ion rechargeable electrochem. cells)
 IT 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate
 108-32-7, Propylene carbonate 556-65-0, Lithium thiocyanate
 685-91-6, n,n-Diethylacetamide 1313-13-9, Manganese dioxide,
 uses 1313-99-1, Nickel oxide (NiO), uses 1314-62-1, Vanadia,
 uses 1317-37-9, Iron sulfide (FeS) 1332-37-2, Iron oxide, uses

10/658,272-266144-EIC 1700 SEARCH

1344-70-3, Copper oxide 2923-17-3 4437-85-8, Butylene carbonate 7782-42-5, Graphite, uses 7784-01-2, Silver chromate 7789-19-7, Copperfluoride (CuF₂) 7791-03-9, Lithium perchlorate 11098-99-0, Molybdenum oxide 11099-11-9, Vanadium oxide 11104-61-3, Cobalt oxide 11105-02-5, Silver vanadium oxide 11113-75-0, Nickel sulfide 11115-76-7, Cobalt selenide 11115-77-8, Cobalt telluride 11115-78-9, Copper sulfide 11115-99-4, Nickel selenide 11116-00-0, Nickel telluride 11118-57-3, Chromium oxide 11126-12-8, Iron sulfide 11129-60-5, Manganese oxide 11130-24-8, Vanadium sulfide 12031-65-1, Lithium nickel oxide (LiNiO₂) 12039-13-3, Titanium sulfide (TiS₂) 12057-17-9, Lithium manganese oxide (LiMn₂O₄) 12057-24-8, Lithia, uses 12068-85-8, Iron sulfide (FeS₂) 12162-79-7, Lithium manganese oxide (LiMnO₂) 12162-92-4, Lithium vanadium oxide (LiV₂O₅) 12190-79-3, Cobalt lithium oxide (CoLiO₂) 12612-50-9, Molybdenum sulfide 12623-97-1, Chromium sulfide 12627-00-8, Niobium oxide 12653-56-4, Cobalt sulfide 12673-92-6, Titanium sulfide 12687-82-0, Manganese sulfide 12789-09-2, Copper vanadium oxide 12795-09-4, Copper telluride 13453-75-3 13463-67-7, Titanium oxide, uses 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate 15955-98-3, Lithium tetrachlorogallate 18424-17-4, Lithium hexafluoroantimonate 20667-12-3, Silver oxide (Ag₂O) 21324-40-3, Lithium hexafluorophosphate 22205-45-4, Copper sulfide (Cu₂S) 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate 37320-90-4, Manganese selenide 37359-15-2, Copper selenide 39290-91-0, Niobium sulfide 39361-71-2, Titanium telluride 50808-87-2, Molybdenum telluride 50814-22-7, Chromium telluride 50926-12-0, Iron selenide 50926-13-1, Iron telluride 51311-17-2, Carbon fluoride 54183-54-9, Molybdenum selenide 54427-25-7, Vanadium telluride 58319-81-6, Manganese telluride 64176-75-6, Niobium selenide 66675-50-1, Titanium selenide 66675-60-3, Chromium selenide 90076-65-6 115028-88-1 131344-56-4, Cobalt lithium nickel oxide 132404-42-3 135751-98-3, Vanadium selenide 162124-03-0, Niobium telluride 181183-66-4, Copper Silver vanadium oxide 188029-35-8, Lithium titanium oxide (Li₄-7Ti₅O₁₂) 423734-10-5, Cobalt lithium nitride (Co_{0.1}-0.6Li_{2.4}-2.9N) 423734-14-9, Lithium nickel nitride (Li_{2.4}-2.9Ni_{0.1}-0.6N) 527698-30-2, Copper lithium tin oxide (Cu_{0.92}LiSn_{0.08}O₂)

RL: DEV (Device component use)

(in-situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochem. cells)

- IT 26426-04-0P, Trimethylolpropane trimethacrylate homopolymer
57592-66-2P, Pentaerythritol tetraacrylate homopolymer
57592-67-3P, Hexanediol diacrylate homopolymer 64401-02-1P, Bisphenol A-ethylene oxide adduct diacrylate
67653-78-5P, Dipentaerythritol hexaacrylate homopolymer
82200-28-0P, Dipentaerythritol pentaacrylate homopolymer
85887-85-0P, Ethoxylated trimethylolpropane triacrylate homopolymer 103315-68-0P, Di(trimethylolpropane)tetraacrylate homopolymer 117223-60-6P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation)

(in-situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochem. cells)

L132 ANSWER 6 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2002:964691 HCAPLUS Full-text

DOCUMENT NUMBER: 138:42046

TITLE: Secondary lithium battery

INVENTOR(S): Seki, Keiichi; Kobayashi, Mitsuharu; Saito, Hiroyuki; Yamamoto, Masaki

10/658,272-266144-EIC 1700 SEARCH

PATENT ASSIGNEE(S): Mitsubishi Chemical Corporation, Japan
 SOURCE: PCT Int. Appl., 78 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------|--------------|
| WO 2002101869 | A1 | 20021219 | WO 2002-JP5656 | 2002 0607 |

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 W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA,
 CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI,
 GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KR,
 KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
 MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI,
 SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU,
 ZA, ZM, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT,
 BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,
 NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
 ML, MR, NE, SN, TD, TG

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|---------------|----|----------|----------------|--------------|
| AU 2002306285 | A1 | 20021223 | AU 2002-306285 | 2002 0607 |
|---------------|----|----------|----------------|--------------|

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|---------------|---|----------|----------------|--------------|
| JP 2003086249 | A | 20030320 | JP 2002-166936 | 2002 0607 |
|---------------|---|----------|----------------|--------------|

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|------------|----|----------|----------------|--------------|
| EP 1406338 | A1 | 20040407 | EP 2002-733389 | 2002 0607 |
|------------|----|----------|----------------|--------------|

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 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,
 MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR
 CN 1799162 A 20060705 CN 2002-811342

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|----------------|----|----------|----------------|--------------|
| US 20040110068 | A1 | 20040610 | US 2003-727661 | 2003 1205 |
|----------------|----|----------|----------------|--------------|

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|------------------------|----------------|---|--------------|
| PRIORITY APPLN. INFO.: | JP 2001-171851 | A | 2001 0607 |
|------------------------|----------------|---|--------------|

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| JP 2001-179748 | A | 2001 0614 |
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| JP 2001-192635 | A | 2001 0626 |
|----------------|---|--------------|

| | | |
|----------------|---|--------------|
| WO 2002-JP5656 | W | 2002 0607 |
|----------------|---|--------------|

ED Entered STN: 20 Dec 2002
 AB The battery has a cathode, an anode, and an electrolyte in a flexible battery case;
 where the enthalpy difference between the neutral nonaq. electrolyte solvent mol. and

10/658,272-266144-EIC 1700 SEARCH

it monovalent anion radical, formed by adding an electron to the mol., ΔE_{sol} is greater than the enthalpy difference between an additive in the battery and it monovalent anion radical, formed by adding an electron to the mol., ΔE_{add} . The additive is preferably a Lewis acid, e.g. a S compound having a S:O bonding.

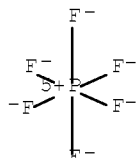
IT 21324-40-3, Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(enthalpy difference between neutral mol. and monovalent anion radical of solvent and additive in electrolytes for secondary lithium batteries)

RN 21324-40-3 HCAPLUS

CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



IT 67-71-0, Dimethyl sulfone 126-33-0, Sulfolane

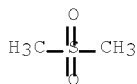
1600-44-8, Tetramethylene sulfoxide

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(enthalpy difference between neutral mol. and monovalent anion radical of solvent and additive in electrolytes for secondary lithium batteries)

RN 67-71-0 HCAPLUS

CN Methane, 1,1'-sulfonylbis- (CA INDEX NAME)



RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 1600-44-8 HCAPLUS

CN Thiophene, tetrahydro-, 1-oxide (CA INDEX NAME)



10/658,272-266144-EIC 1700 SEARCH

IC ICM H01M010-40
ICS H01M004-58; H01M004-62; H01M004-02; H01M002-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary lithium battery sulfur
compd additive enthalpy; electrolyte solvent enthalpy
secondary lithium battery
IT Battery electrolytes
Enthalpy
(enthalpy difference between neutral mol. and monovalent anion
radical of solvent and additive in electrolytes for
secondary lithium batteries)
IT Secondary batteries
(lithium; enthalpy difference between neutral mol.
and monovalent anion radical of solvent and additive in
electrolytes for secondary lithium
batteries)
IT 21324-40-3, Lithium hexafluorophosphate
RL: DEV (Device component use); USES (Uses)
(enthalpy difference between neutral mol. and monovalent anion
radical of solvent and additive in electrolytes for
secondary lithium batteries)
IT 64-67-5, Diethyl sulfate 66-27-3, Methyl methanesulfonate
67-68-5, Dimethyl sulfoxide, uses 67-71-0, Dimethyl
sulfone 96-49-1, Ethylene carbonate 108-32-7, Propylene
carbonate 126-33-0, Sulfolane 616-42-2, Dimethyl
sulfite 1120-71-4, 1,3-Propanesultone 1600-44-8,
Tetramethylene sulfoxide 3741-38-6, Ethylene sulfite
478784-91-7, Ethylene glycol sulfate
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(enthalpy difference between neutral mol. and monovalent anion
radical of solvent and additive in electrolytes for
secondary lithium batteries)
REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

L132 ANSWER 7 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2002:773875 HCAPLUS Full-text
DOCUMENT NUMBER: 137:313485
TITLE: Organic electrolyte battery
INVENTOR(S): Takahashi, Tadayoshi; Kawaguchi, Shinichi;
Koshiba, Tokiharu
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd.,
Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------|--------------|
| ----- | ---- | ----- | ----- | |
| JP 2002298911 | A | 20021011 | JP 2001-95743 | 2001 0329 |

PRIORITY APPLN. INFO.: <--
JP 2001-95743
2001
0329

ED Entered STN: 11 Oct 2002

10/658,272-266144-EIC 1700 SEARCH

AB The battery has a cathode, an anode, a separator, and an electrolyte in a housing containing a gasket between an anode case and a cathode case; where the electrolyte solution contains a LiBF₄, benzenediolatoborate salt, or Li sulfonate salt dissolved in a Bu diglyme containing organic solvent. The gasket is preferably poly(phenylene sulfide), and the separator is poly(phenylene sulfide) or cellulose.

IT 126-33-0, Sulfolane 14283-07-9, Lithium fluoroborate 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6
 RL: DEV (Device component use); USES (Uses)
 (organic solvent mixts containing Bu diglyme for lithium salt electrolyte solns. in secondary lithium batteries)

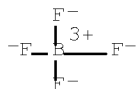
RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



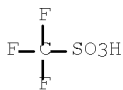
RN 14283-07-9 HCAPLUS

CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



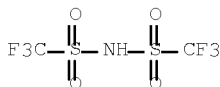
RN 33454-82-9 HCAPLUS

CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



10/658,272-266144-EIC 1700 SEARCH

IC ICM H01M010-40
ICS H01M002-08
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST battery electrolyte lithium
salt org solvent butyl diglyme
IT Polythiophenylenes
RL: DEV (Device component use); USES (Uses)
(gaskets and separators for secondary lithium
batteries using electrolyte solns. containing Bu
diglyme solvent)
IT Secondary batteries
(lithium; secondary lithium
batteries using lithium salt
electrolyte solution containing Bu diglyme solvent and
poly(phenylene sulfide) gaskets and separators)
IT Battery electrolytes
(organic solvent mixts containing Bu diglyme for
lithium salt electrolyte solns. in
secondary lithium batteries)
IT Secondary battery separators
(poly(phenylene sulfide) and cellulose separators for
secondary lithium batteries using
electrolyte solns. containing Bu diglyme solvent)
IT Gaskets
(poly(phenylene sulfide) gaskets for secondary
lithium batteries using electrolyte
solns. containing Bu diglyme solvent)
IT 9004-34-6, Cellulose, uses
RL: DEV (Device component use); USES (Uses)
(cellulose separators for secondary lithium
batteries using electrolyte solns. containing Bu
diglyme solvent)
IT 112-34-5 126-33-0, Sulfolane 143-24-8, Tetraglyme
14283-07-9, Lithium fluoroborate 33454-82-9,
Lithium trifluoromethanesulfonate 90076-65-6
132843-44-8 176719-70-3
RL: DEV (Device component use); USES (Uses)
(organic solvent mixts containing Bu diglyme for
lithium salt electrolyte solns. in
secondary lithium batteries)

L132 ANSWER 8 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2001:726702 HCAPLUS Full-text
DOCUMENT NUMBER: 135:259876
TITLE: Organic electrolyte batteries
INVENTOR(S): Takahashi, Tadayoshi; Kawaguchi, Shinichi
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd.,
Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------|--------------|
| ----- | ---- | ----- | ----- | |
| JP 2001273926 | A | 20011005 | JP 2000-88000 | 2000 0328 |

PRIORITY APPLN. INFO.:

JP 2000-88000

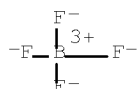
10/658,272-266144-EIC 1700 SEARCH

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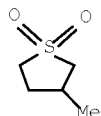
ED Entered STN: 05 Oct 2001
 AB The batteries have a cathode, an anode, a separator, and an electrolyte solution in a housing containing a cathode case, an anode case, and a gasket; where the electrolyte solution contains a LiBF₄ based solute dissolved in a tetraglyme based org . solvent.
 IT 14283-07-9, Lithium fluoroborate
 RL: DEV (Device component use); USES (Uses)
 (electrolyte solns. containing lithium
 fluoroborate dissolved in tetraglyme based solvent for
 secondary lithium batteries)
 RN 14283-07-9 HCAPLUS
 CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



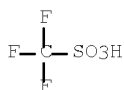
IT 126-33-0, Sulfolane 872-93-5, 3-Methyl sulfolane
 33454-82-9, Lithium trifluoromethanesulfonate
 RL: DEV (Device component use); USES (Uses)
 (electrolyte solns. containing lithium
 salts dissolved in tetraglyme based solvent for
 secondary lithium batteries)
 RN 126-33-0 HCAPLUS
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 872-93-5 HCAPLUS
 CN Thiophene, tetrahydro-3-methyl-, 1,1-dioxide (CA INDEX NAME)



RN 33454-82-9 HCAPLUS
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



● Li

IC ICM H01M010-40
ICS H01M006-16
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST battery electrolyte lithium fluoroborate tetraglyme solvent
IT Battery electrolytes
(electrolyte solns. containing lithium salts dissolved in tetraglyme based solvent for secondary lithium batteries)
IT 14283-07-9, Lithium fluoroborate
RL: DEV (Device component use); USES (Uses)
(electrolyte solns. containing lithium fluoroborate dissolved in tetraglyme based solvent for secondary lithium batteries)
IT 126-33-0, Sulfolane 143-24-8, Tetraglyme 372-93-5, 3-Methyl sulfolane 33454-82-9, Lithium trifluoromethanesulfonate
RL: DEV (Device component use); USES (Uses)
(electrolyte solns. containing lithium salts dissolved in tetraglyme based solvent for secondary lithium batteries)

L132 ANSWER 9 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2001:360327 HCAPLUS Full-text
DOCUMENT NUMBER: 134:355483
TITLE: Lithium batteries
INVENTOR(S): Mikhaylik, Yuriy V.; Skotheim, Terje A.; Trofimov, Boris A.
PATENT ASSIGNEE(S): Moltech Corporation, USA
SOURCE: PCT Int. Appl., 37 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------|--------------|
| WO 2001035483 | A1 | 20010517 | WO 2000-US31047 | 2000 1110 |

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W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
EP 1232536 A1 20020821 EP 2000-980350

2000

10/658,272-266144-EIC 1700 SEARCH

1110

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EP 1232536 B1 20050316
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,
 MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR
 JP 2003514356 T 20030415 JP 2001-537121

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US 6569573 B1 20030527 US 2000-709242

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US 20030180611 A1 20030925 US 2003-390516

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US 6936382 B2 20050830
 PRIORITY APPLN. INFO.: US 1999-165368P P

1999

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US 2000-709242 A1

2000

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WO 2000-US31047 W

2000

1110

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OTHER SOURCE(S): MARPAT 134:355483

ED Entered STN: 18 May 2001

AB A lithium battery has the cathode comprising an electroactive sulfur-containing material and the electrolyte comprising a lithium salt, a nonaq. solvent, and one or more capacity-enhancing reactive components. Suitable reactive components include electron transfer mediators. Also are provided methods for making the lithium battery.

IT 126-33-0, Sulfolane 10377-51-2, Lithium iodide 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6

RL: DEV (Device component use); USES (Uses)
 (lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 10377-51-2 HCAPLUS

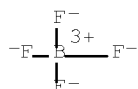
CN Lithium iodide (LiI) (CA INDEX NAME)

I-Li

RN 14283-07-9 HCAPLUS

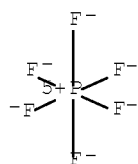
10/658,272-266144-EIC 1700 SEARCH

CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



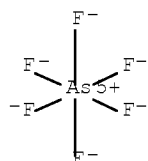
RN 21324-40-3 HCAPLUS

CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



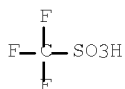
RN 29935-35-1 HCAPLUS

CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



RN 33454-82-9 HCAPLUS

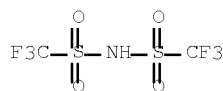
CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS

10/658,272-266144-EIC 1700 SEARCH

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-
, lithium salt (1:1) (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M010-42
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium battery sulfur contg electroactive material
IT Polysulfides
RL: DEV (Device component use); USES (Uses)
(alkyloxyalkyl derivs.; lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)
IT Ethers, uses
RL: DEV (Device component use); USES (Uses)
(cyclic; lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)
IT Battery cathodes
Battery electrolytes
(lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)
IT Ethers, uses
Polyethers, uses
Sulfones
RL: DEV (Device component use); USES (Uses)
(lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)
IT Carbon black, uses
RL: MOA (Modifier or additive use); USES (Uses)
(lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)
IT Secondary batteries
(lithium; lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)
IT 110-71-4 126-33-0, Sulfolane 556-65-0, Lithium thiocyanate 646-06-0, Dioxolane 7550-35-8, Lithium bromide 7704-34-9, Sulfur, uses 10377-81-2, Lithium iodide 12798-95-7 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 39448-96-9, Graphite lithium 53680-59-4 69177-66-8 74432-42-1, Lithium polysulfide 90076-65-6 132404-42-3 339186-87-7
RL: DEV (Device component use); USES (Uses)
(lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)
IT 7440-44-ODP, Carbon, lithium-intercalated, uses

10/658,272-266144-EIC 1700 SEARCH

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)

IT 1942-52-5, 2-(Diethylamino) ethanethiol hydrochloride 7782-42-5, Graphite, uses 25085-35-2, Acrylic acid-ethyl acrylate copolymer 64265-57-2, Ionac PFAZ 322 339186-88-8

RL: MOA (Modifier or additive use); USES (Uses)

(lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L132 ANSWER 10 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2001:360320 HCAPLUS Full-text

DOCUMENT NUMBER: 134:355476

TITLE: Lithium primary batteries

INVENTOR(S): Mikhaylik, Yuriy V.; Skotheim, Terje A.; Angell, Charles A.

PATENT ASSIGNEE(S): Moltech Corporation, USA

SOURCE: PCT Int. Appl., 35 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. ----- | KIND ---- | DATE ----- | APPLICATION NO. ----- | DATE |
|---------------------|--------------|---------------|--------------------------|--------------|
| WO 2001035475 | A1 | 20010517 | WO 2000-US30911 | 2000 1110 |

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W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: US 1999-165154P P 1999
1112

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OTHER SOURCE(S): MARPAT 134:355476

ED Entered STN: 18 May 2001

AB In a lithium primary battery, the cathode comprises an electroactive sulfur-containing material and the electrolyte comprises one or more aonaq. solvents and one or more voltage-enhancing reactive components, wherein the reactive components are non-electroactive but enhance the voltage of the lithium primary battery. Suitable voltage-enhancing reactive components include organic halides, inorg. halides, and phosphorus chalcogenides. Also are provided methods for making the lithium primary battery.

IT 10377-51-2, Lithium iodide 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6

RL: DEV (Device component use); USES (Uses)

(lithium primary batteries with

10/658,272-266144-EIC 1700 SEARCH

electroactive sulfur-containing material cathode and
electrolyte with voltage-enhancing reactive components)

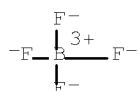
RN 10377-51-2 HCAPLUS

CN Lithium iodide (LiI) (CA INDEX NAME)

I—Li

RN 14283-07-9 HCAPLUS

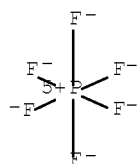
CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



● Li⁺

RN 21324-40-3 HCAPLUS

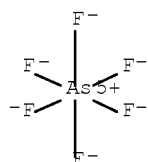
CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



● Li⁺

RN 29935-35-1 HCAPLUS

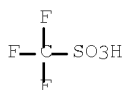
CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



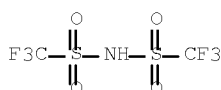
● Li⁺

RN 33454-82-9 HCAPLUS

CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-
 , lithium salt (1:1) (CA INDEX NAME)



IT 126-33-0, Sulfolane
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (lithium primary batteries with
 electroactive sulfur-containing material cathode and
 electrolyte with voltage-enhancing reactive components)
 RN 126-33-0 HCAPLUS
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M006-16
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium primary battery
 IT Primary batteries
 (button-type; lithium primary batteries
 with electroactive sulfur-containing material cathode and
 electrolyte with voltage-enhancing reactive components)
 IT Ethers, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (cyclic; lithium primary batteries with
 electroactive sulfur-containing material cathode and
 electrolyte with voltage-enhancing reactive components)
 IT Battery cathodes
 Battery electrolytes
 (lithium primary batteries with
 electroactive sulfur-containing material cathode and
 electrolyte with voltage-enhancing reactive components)
 IT Polysulfides
 RL: DEV (Device component use); USES (Uses)
 (lithium primary batteries with
 electroactive sulfur-containing material cathode and

10/658,272-266144-EIC 1700 SEARCH

electrolyte with voltage-enhancing reactive components)

IT Esters, uses
Ethers, uses
Polyethers, uses
Sulfites
Sulfones
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT Carbon black, uses
Carbon fibers, uses
Halides
RL: MOA (Modifier or additive use); USES (Uses)
(lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT Primary batteries
(lithium; lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT Halides
RL: MOA (Modifier or additive use); USES (Uses)
(organic; lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT Hydrocarbons, uses
RL: MOA (Modifier or additive use); USES (Uses)
(perchlorocarbons; lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT Group VA element chalcogenides
RL: MOA (Modifier or additive use); USES (Uses)
(phosphorus chalcogenides; lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT 7439-93-2, Lithium, uses 7440-44-0D, Carbon, lithium intercalated, uses 7550-35-8, Lithium bromide 7704-34-9, Sulfur, uses 10377-51-2, Lithium iodide 12798-95-7 14283-07-9, Lithium tetrafluoroborate 21324-40-3 , Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 39448-96-9, Graphite lithium 53680-59-4 74432-42-1, Lithium polysulfide 90076-65-6 132404-42-3
RL: DEV (Device component use); USES (Uses)
(lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT 126-33-0, Sulfolane
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT 56-23-5, Carbon tetrachloride, uses 1314-56-3, Phosphorus oxide (P2O5), uses 1314-80-3, Phosphorus sulfide p2s5 2551-62-4, Sulfur hexafluoride 7446-70-0, Aluminum chloride, uses 7550-45-0, Titanium tetrachloride, uses 7637-07-2, Boron trifluoride, uses 7647-19-0, Phosphorus pentafluoride 7719-12-2, Phosphorus trichloride 7783-60-0, Sulfur tetrafluoride 7784-18-1, Aluminum fluoride 7786-30-3, Magnesium chloride, uses 10026-04-7, Silicon tetrachloride 10026-13-8, Phosphorus pentachloride 10294-34-5, Boron trichloride 16752-60-6, Phosphorus pentoxide dimer 158970-02-6, Phosphorus oxide sulfide

10/658,272-266144-EIC 1700 SEARCH

RL: MOA (Modifier or additive use); USES (Uses)

(lithium primary batteries with
electroactive sulfur-containing material cathode and
electrolyte with voltage-enhancing reactive components)REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

L132 ANSWER 11 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2001:186088 HCAPLUS Full-text

DOCUMENT NUMBER: 134:210595

TITLE: Polymer electrolytes, nonaqueous electrolyte
solutions, and electric devices containing the
electrolytesINVENTOR(S): Nishiura, Masahito; Kono, Michiyuki; Watanabe,
Masayoshi

PATENT ASSIGNEE(S): Dai-Ichi Kogyo Seiyaku Co., Ltd., Japan

SOURCE: PCT Int. Appl., 40 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------|--------------|
| WO 2001018898 | A1 | 20010315 | WO 2000-JP5812 | 2000 0828 |

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W: CA, US

RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU,

MC, NL, PT, SE

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|---------------|---|----------|----------------|--------------|
| JP 2001072878 | A | 20010321 | JP 1999-248890 | 1999 0902 |
|---------------|---|----------|----------------|--------------|

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|---------------|----|----------|----------------|--------------|
| JP 3557962 | B2 | 20040825 | | |
| JP 2001076755 | A | 20010323 | JP 1999-248891 | 1999 0902 |

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|------------|----|----------|-----------------|--------------|
| CA 2344243 | A1 | 20010315 | CA 2000-2344243 | 2000 0828 |
|------------|----|----------|-----------------|--------------|

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|------------|----|----------|----------------|--------------|
| CA 2344243 | C | 20060509 | | |
| EP 1130671 | A1 | 20010905 | EP 2000-955081 | 2000 0828 |

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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,

MC, PT, IE, FI

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|------------|----|----------|----------------|--------------|
| US 6673495 | B1 | 20040106 | US 2001-787231 | 2001 0425 |
|------------|----|----------|----------------|--------------|

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|----------|----|----------|----------------|--------------|
| US 40302 | E1 | 20080506 | US 2001-327829 | 2001 0425 |
|----------|----|----------|----------------|--------------|

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| PRIORITY APPLN. INFO.: | | | JP 1999-248890 | A | 1999 0902 |
|------------------------|--|--|----------------|---|--------------|

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JP 1999-248891 A

10/658,272-266144-EIC 1700 SEARCH

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WO 2000-JP5812

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2001

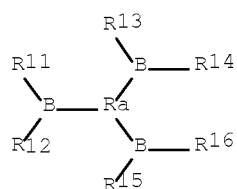
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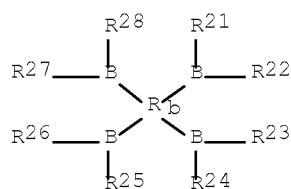
OTHER SOURCE(S): MARPAT 134:210595

ED Entered STN: 16 Mar 2001

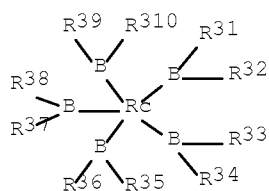
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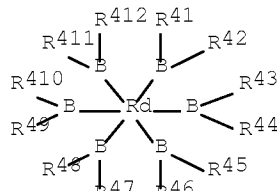
I



II



III



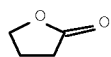
IV

AB Polymer electrolytes contain an electrolyte salt, a polymer forming a complex with the salt and a B containing additive selected from I-IV, where R11-412 = H, halogen, a monovalent group, or bonded to another member of R11-412 to form a ring; and R_a , R_b , R_c , and R_d = groups connecting the B containing parts. The polymer electrolytes may contain a nonaq. solvent. The nonaq. electrolyte solns. has an electrolyte salt dissolved in a nonaq. solvent and contain the B containing additive. The elec. devices are batteries having the polymer electrolyte between a cathode and an anode, and are preferably secondary Li batteries.

IT 96-48-0, γ -Butyrolactone 126-33-0,
Sulfolane 7447-41-8, Lithium chloride, uses
7791-03-9, Lithium perchlorate
10377-51-2, Lithium iodide 14283-07-9,
Lithium fluoroborate 21324-40-3, Lithium
hexafluorophosphate 29935-35-1, Lithium
hexafluoroarsenate 33454-82-9, Lithium
trifluoromethanesulfonate 90076-65-6
RL: DEV (Device component use); USES (Uses)
(polymer electrolytes and nonaq. electrolyte solns.
containing boron compound additives for secondary
lithium batteries)

RN 96-48-0 HCAPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



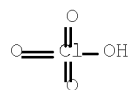
RN 126-33-0 HCAPLUS
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 7447-41-8 HCAPLUS
 CN Lithium chloride (LiCl) (CA INDEX NAME)



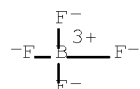
RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



RN 10377-51-2 HCAPLUS
 CN Lithium iodide (LiI) (CA INDEX NAME)



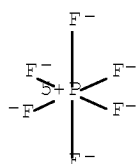
RN 14283-07-9 HCAPLUS
 CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



RN 21324-40-3 HCAPLUS

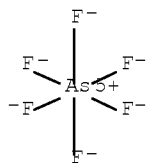
10/658,272-266144-EIC 1700 SEARCH

CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



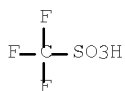
RN 29935-35-1 HCAPLUS

CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



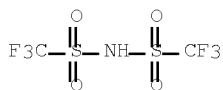
RN 33454-82-9 HCAPLUS

CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



10/658,272-266144-EIC 1700 SEARCH

IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST secondary lithium battery
 electrolyte boron compd additive
 IT Battery electrolytes
 (polymer electrolytes and nonaq. electrolyte solns. containing boron compound additives for secondary lithium batteries)
 IT 328311-64-4 328311-65-5 328311-66-6 328311-67-7
 328311-68-8 328311-69-9
 RL: MOA (Modifier or additive use); USES (Uses)
 (boron compound additives in polymer electrolytes and nonaq. electrolyte solns. for secondary lithium batteries)
 IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 110-71-4 126-33-0, Sulfolane 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 646-06-0, 1,3-Dioxolane 7447-41-3, Lithium chloride, uses 7550-35-8, Lithium bromide 7789-24-4, Lithium fluoride, uses 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 14283-07-9, Lithium fluoroborate 21324-40-3, Lithium hexafluorophosphate 26570-48-9 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6
 111804-95-6 132404-42-3 132843-44-8 152986-27-1
 328312-84-1 328312-85-2 328312-86-3 328312-89-6
 328312-90-9 328396-49-2 328396-51-6
 RL: DEV (Device component use); USES (Uses)
 (polymer electrolytes and nonaq. electrolyte solns. containing boron compound additives for secondary lithium batteries)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE
 FOR THIS RECORD. ALL CITATIONS AVAILABLE
 IN THE RE FORMAT

L132 ANSWER 12 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2000:861126 HCAPLUS Full-text

DOCUMENT NUMBER: 134:7008

TITLE: Nonaqueous electrolyte battery

INVENTOR(S): Yamaura, Kiyoshi

PATENT ASSIGNEE(S): Sony Corp., Japan

SOURCE: Eur. Pat. Appl., 12 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|--|------|----------|-----------------|--------------|
| ----- | ---- | ----- | ----- | |
| EP 1058325 | A2 | 20001206 | EP 2000-111667 | 2000 0531 |
| <-- | | | | |
| EP 1058325 | A3 | 20031203 | | |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO | | | | |
| JP 2000348722 | A | 20001215 | JP 1999-158355 | 1999 0604 |
| <-- | | | | |
| US 6627351 | B1 | 20030930 | US 2000-586895 | |

10/658,272-266144-EIC 1700 SEARCH

2000

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PRIORITY APPLN. INFO.:

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JP 1999-158355 A

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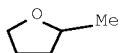
ED Entered STN: 08 Dec 2000

AB A nonaq. electrolyte battery free from considerable change in the structure of a cathode active material thereof to enlarge the capacity thereof, incorporating a cathode containing a cathode active material; an anode containing an anode active material to which Li can be doped/dedoped; and a nonaq. electrolyte disposed between the cathode and the anode and containing nonaq. solvent and an electrolyte, wherein a material expressed by general formula $\text{LiMn}_{1-y}\text{Al}_y\text{O}_2$ ($0.06 \leq y < 0.25$) is contained as the cathode active material and $\text{LiMn}_{1-y}\text{Al}_y\text{O}_2$ has a crystalline structure expressed by spatial group C2/m.

IT 96-47-9, 2-Methyltetrahydrofuran 96-48-0,
 γ -Butyrolactone 109-99-9, Thf, uses
126-33-0, Sulfolane 7447-41-8, Lithium chloride,
uses 7791-08-9, Lithium perchlorate
14283-07-9, Lithium tetrafluoroborate
21324-40-3, Lithium hexafluorophosphate
29935-35-1, Lithium hexafluoroarsenate
33454-82-9, Lithium trifluoromethanesulfonate
35678-71-8, Methylsulfolane
RL: DEV (Device component use); USES (Uses)
(nonaq. electrolyte battery)

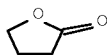
RN 96-47-9 HCAPLUS

CN Furan, tetrahydro-2-methyl- (CA INDEX NAME)



RN 96-48-0 HCAPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



RN 109-99-9 HCAPLUS

CN Furan, tetrahydro- (CA INDEX NAME)



RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)

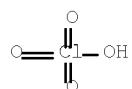


10/658,272-266144-EIC 1700 SEARCH

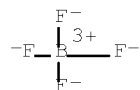
RN 7447-41-8 HCAPLUS
CN Lithium chloride (LiCl) (CA INDEX NAME)



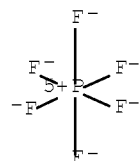
RN 7791-03-9 HCAPLUS
CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



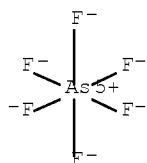
RN 14283-07-9 HCAPLUS
CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



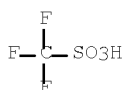
RN 21324-40-3 HCAPLUS
CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



RN 29935-35-1 HCAPLUS
CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



RN 33454-82-9 HCAPLUS
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 35678-71-8 HCAPLUS
 CN Thiophene, tetrahydromethyl-, 1,1-dioxide (CA INDEX NAME)



D1-Me

IC ICM H01M004-48
 ICS H01M004-50
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST nonaq electrolyte lithium battery;
 aluminum lithium manganese oxide cathode battery
 IT Battery cathodes
 (aluminum lithium manganese oxide; nonaq. electrolyte battery)
 IT Secondary batteries
 (lithium; nonaq. electrolyte battery)
 IT Lithium alloy
 RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte battery)
 IT 60-29-7, Diethyl ether, uses 75-05-8, Acetonitrile, uses 96-47-9, 2-Methyltetrahydrofuran 96-48-0,
 γ-Butyrolactone 96-49-1, Ethylene carbonate 100-66-3,
 Anisole, uses 105-58-8, Diethyl carbonate 107-12-0,
 Propionitrile 109-99-9, Thf, uses 110-71-4,
 1,2-Dimethoxyethane 126-33-0, Sulfolane 616-38-6,
 Dimethyl carbonate 629-14-1, 1,2-Diethoxyethane 646-06-0,

10/658,272-266144-EIC 1700 SEARCH

1,3-Dioxolane 1072-47-5, 4-Methyl-1,3-dioxolane 2550-62-1,
 Lithium methanesulfonate 7439-93-2, Lithium,
 uses 7447-41-8, Lithium chloride, uses 7550-35-8,
 Lithium bromide 7791-03-9, Lithium
 perchlorate 14283-07-9, Lithium
 tetrafluoroborate 14485-20-2, Lithium
 tetraphenylborate 21324-40-3, Lithium
 hexafluorophosphate 29935-35-1, Lithium
 hexafluoroarsenate 33454-82-9, Lithium
 trifluoromethanesulfonate 35678-71-8, Methylsulfolane
 110320-40-6, Polypropylene carbonate
 RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte battery)

L132 ANSWER 13 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2000:629942 HCAPLUS Full-text

DOCUMENT NUMBER: 133:180331

TITLE: Manufacture of lithium ion
 battery

INVENTOR(S): Yang, Hanxi; Dong, Quanfeng; Ai, Xinning

PATENT ASSIGNEE(S): Wuhan University, Peop. Rep. China

SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 5
 PP.
 CODEN: CNXXEV

DOCUMENT TYPE: Patent

LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. ----- | KIND ---- | DATE ----- | APPLICATION NO. ----- | DATE |
|------------------------|--------------|---------------|--------------------------|--------------|
| CN 1241041 | A | 20000112 | CN 1998-113625 | 1998 0708 |
| | | | <-- | |
| CN 1107356 | C | 20030430 | | |
| PRIORITY APPLN. INFO.: | | | CN 1998-113625 | 1998 0708 |
| | | | <-- | |

ED Entered STN: 12 Sep 2000

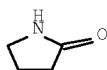
AB The diaphragm of the battery is manufactured by dissolving copolymer in organic solvent, mixing with additive, preparing thin film (5-250 μ m) by screen-printing or coating method, and drying at 30-100° in vacuum. The cathode film of the battery is manufactured by mixing LiMn2O4, LiCoO2, or LiNiO2, acetylene black, copolymer, and pore-forming agent at 10:(1-5):(1-8):(1-6), coating the mixture onto metal foil or metal gauze, and drying at 30-100° in vacuum. The anode film is manufactured by mixing graphite or coke, acetylene black, copolymer, and pore forming agent at 10:(1-3):(1-8):(1-8), coating the mixture onto metal foil or gauze, and drying at 30-100° in vacuum. The battery is manufactured by laminating the cathode film, diaphragm, and anode film; filling electrolyte; drying to obtain dry-state film battery; and cutting. The copolymer is vinylidene fluoride-hexafluoropropylene copolymer; the organic solvent is selected from THF, Me sulfoxide, N,N-DMF, acetone, methylethyl ketone, pyrrolidone, cyclohexanone, and butanone; the additive is from camphor, naphthalene, anthracene, phenanthrene, and their derivs.

IT 616-45-5, Pyrrolidone

RL: MOA (Modifier or additive use); USES (Uses)
 (solvent; in manufacture of lithium ion
 battery)

RN 616-45-5 HCAPLUS

CN 2-Pyrrolidinone (CA INDEX NAME)



IC ICM H01M010-38
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium ion battery manuf
 IT Coating process
 Screen printing
 (in manufacture of lithium ion battery)
)
 IT Carbon black, uses
 Coke
 RL: DEV (Device component use); USES (Uses)
 (in manufacture of lithium ion battery)
)
 IT Battery anodes
 Battery cathodes
 Secondary batteries
 Secondary battery separators
 (manufacture of lithium ion battery)
 IT 76-22-2, Camphor 85-01-8, Phenanthrene, uses 91-20-3,
 Naphthalene, uses 120-12-7, Anthracene, uses 7782-42-5,
 Graphite, uses 9011-17-0, Hexafluoropropylene-vinylidene
 fluoride copolymer 12031-65-1, Lithium nickel oxide (LiNiO₂)
 12057-17-9, Lithium manganese oxide (LiMn₂O₄)
 RL: DEV (Device component use); USES (Uses)
 (in manufacture of lithium ion battery)
)
 IT 67-64-1, Acetone, uses 67-68-5, Methyl sulfoxide, uses
 68-12-2, N,N-Dimethyl formamide, uses 78-93-3, Methyleneethyl
 ketone, uses 616-45-5, Pyrrolidone
 RL: MOA (Modifier or additive use); USES (Uses)
 (solvent; in manufacture of lithium ion
 battery)

L132 ANSWER 14 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2000:421456 HCAPLUS Full-text
 DOCUMENT NUMBER: 133:32706
 TITLE: Nonaqueous electrolytes for batteries
 INVENTOR(S): Mikhaylik, Yuriy V.; Skotheim, Terje A.;
 Gorkovenko, Alexander A.
 PATENT ASSIGNEE(S): Moltech Corp., USA
 SOURCE: PCT Int. Appl., 51 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------|--------------|
| WO 2000036683 | A2 | 20000622 | WO 1999-US30116 | 1999 1216 |

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WO 2000036683 A3 20001109
 W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR,
 CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR,
 HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
 LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL,

10/658,272-266144-EIC 1700 SEARCH

PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ,
 UA, UG, US, UZ, VN, YU, ZA, ZW
 RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH,
 CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT,
 SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN,
 TD, TG

EP 1149428 A2 20011031 EP 1999-967390
 1999
 1216

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EP 1149428 B1 20030319
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,
 MC, PT, IE, SI, LT, LV, FI, RO

PRIORITY APPLN. INFO.: US 1998-215115 A2
 1998
 1217

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WO 1999-US30116 W
 1999
 1216

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ED Entered STN: 23 Jun 2000

AB The present invention relates generally to the field of nonaq. electrolytes for use in elec. current producing cells. More particularly, the present invention pertains to nonaq. electrolytes comprising a highly concentrated solution of one or more lithium salts in one or more nonaq. solvents. More specifically, the present invention pertains to nonaq. electrolytes, suitable for use in an elec. current producing cell, comprising: (a) one or more lithium salts, dissolved in (b) one or more nonaq. oxygen-containing solvents; wherein the concentration of the one or more lithium salts is: (i) >110% of the molar concentration of the one or more lithium salts which would provide maximum ionic conductivity at 25° in the one or more solvents; and, (ii) >1.3M. The present invention also pertains to elec. current producing cells comprising such nonaq. electrolytes, and methods for increasing the safety and cycle life of an elec. current producing cell.

IT 77-79-2, 3-Sulfolene 96-47-9,
 2-Methyltetrahydrofuran 109-99-9, uses 126-33-0
 872-93-5, 3-Methylsulfolane 10377-51-2,
 Lithium iodide 33454-82-9, Lithium
 triflate 90076-65-6 274251-47-7
 RL: DEV (Device component use); TEM (Technical or engineered
 material use); USES (Uses)
 (nonaq. electrolytes for batteries)

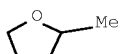
RN 77-79-2 HCAPLUS

CN Thiophene, 2,5-dihydro-, 1,1-dioxide (CA INDEX NAME)



RN 96-47-9 HCAPLUS

CN Furan, tetrahydro-2-methyl- (CA INDEX NAME)



RN 109-99-9 HCAPLUS

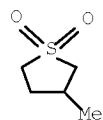
CN Furan, tetrahydro- (CA INDEX NAME)



RN 126-33-0 HCAPLUS
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



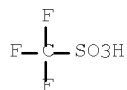
RN 872-93-5 HCAPLUS
 CN Thiophene, tetrahydro-3-methyl-, 1,1-dioxide (CA INDEX NAME)



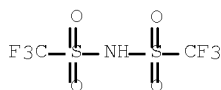
RN 10377-51-2 HCAPLUS
 CN Lithium iodide (LiI) (CA INDEX NAME)



RN 33454-82-9 HCAPLUS
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



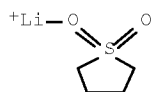
RN 90076-65-6 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



RN 274251-47-7 HCAPLUS
 CN Lithium(1+), [tetrahydrothiophene 1-(oxide-kO) 1-oxide]-,
 salt with 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]methanesulf
 onamide (1:1) (9CI) (CA INDEX NAME)

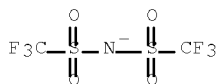
CM 1

CRN 274251-46-6
 CMF C4 H8 Li O2 S
 CCI CCS



CM 2

CRN 98837-98-0
 CMF C2 F6 N O4 S2



IC ICM H01M010-40
 ICS H01M004-58
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)
 IT Battery cathodes
 Battery electrolytes
 Secondary batteries
 Solvates
 (nonaq. electrolytes for batteries)
 IT 7439-93-2, Lithium, uses 7440-44-0D, Carbon,
 lithium-intercalated, uses 7704-34-9, Sulfur, uses 12798-95-7
 39448-96-9, Graphite lithium 53680-59-4
 RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolytes for batteries)
 IT 60-29-7, Diethyl ether, uses 77-79-2, 3-Sulfolene
 96-47-9, 2-Methyltetrahydrofuran 108-20-3, Diisopropyl
 ether 109-87-5, Dimethoxymethane 109-99-9, uses
 110-71-4, Ethylene glycol dimethyl ether 111-43-3, Dipropyl
 ether 111-96-6, DiEthylene glycol dimethyl ether 112-49-2,
 TriEthylene glycol dimethyl ether 115-10-6, Dimethyl ether
 123-91-1, 1,4-Dioxane, uses 126-33-0 142-68-7,
 Tetrahydropyran 142-96-1, Dibutyl ether 143-24-8,

10/658,272-266144-EIC 1700 SEARCH

TetraEthylene glycol dimethyl ether 149-73-5, Trimethoxymethane
 505-22-6, 1,3-Dioxane 505-65-7, 1,3-Dioxepane 505-68-0,
 1,4-Dioxepane 556-65-0, Lithium thiocyanate
 592-90-5, Oxepane 872-93-5, 3-Methylsulfolane
 1634-04-4, Methyl tert-butyl ether 6572-91-4, 1,4-Dioxocane
 7778-85-0, Propylene glycol dimethyl ether 10143-60-9,
 Bis(2-ethylhexyl)ether 10377-51-2, Lithium
 iodide 25190-06-1 33454-82-9, Lithium
 triflate 74432-42-1, Lithium polysulfide
 90076-65-6 111109-77-4, DiPropylene glycol dimethyl
 ether 132404-42-3 274251-44-4 274251-45-5
 274251-47-7 274251-48-8 274251-49-9
 RL: DEV (Device component use); TEM (Technical or engineered
 material use); USES (Uses)
 (nonaq. electrolytes for batteries)

L132 ANSWER 15 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2000:166260 HCAPLUS Full-text
 DOCUMENT NUMBER: 132:196755
 TITLE: Nonaqueous-electrolyte batteries using
 sulfolane or sultone analogs
 INVENTOR(S): Ochiai, Seijiro; Kobayashi, Aya; Inamasu,
 Tokuo
 PATENT ASSIGNEE(S): Yuasa Battery Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------|--------------|
| ----- | ---- | ----- | ----- | |
| JP 2000077098 | A | 20000314 | JP 1998-242729 | 1998 0828 |

PRIORITY APPLN. INFO.: <--
 JP 1998-242729
 1998
 0828

OTHER SOURCE(S): MARPAT 132:196755

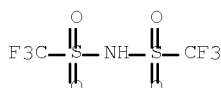
ED Entered STN: 14 Mar 2000

AB The batteries are equipped with cathodes containing Al or Al alloy current collectors and electrolyte solns. or polymer gel electrolytes containing (1) LiOSO₂Rf₁, (2) LiN(SO₂Rf₂)(SO₂Rf₃), and/or (3) LiC(SO₂Rf₄)(SO₂Rf₅)(SO₂Rf₆) (where Rf₁₋₆ = F, CkF_{2k+1}, OCmH_{2m}CnF_{2n+1}; k = 1-5; m = 1 or 2; n = 1-5) and solvents containing sulfolane or sultone-analogs. The batteries have high safety and reliability.

IT 90076-65-6, Lithium bis(trifluoromethylsulfonyl)imide
 RL: DEV (Device component use); USES (Uses)
 (electrolytes; electrolytes containing sulfonyl-type Li salts and
 sulfolane or sultone analogs for nonaq. batteries)

RN 90076-65-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-
 , lithium salt (1:1) (CA INDEX NAME)



● Li

10/658,272-266144-EIC 1700 SEARCH

IT 126-33-0, Sulfolane
 RL: DEV (Device component use); USES (Uses)
 (solvents; electrolytes containing sulfonyl-type Li salts and
 sulfolane or sultone analogs for nonaq. batteries)
 RN 126-33-0 HCAPLUS
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M010-40
 ICS C07D327-04; C07D333-48; H01B001-12; H01M004-66; H01M006-16
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)
 ST sulfolane solvent nonaq electrolyte battery
 safety; sultone solvent nonaq electrolyte
 battery; lithium sulfonylimide electrolyte
 battery
 IT Battery electrolytes
 (electrolytes containing sulfonyl-type Li salts and sulfolane or
 sultone analogs for nonaq. batteries)
 IT Secondary batteries
 (lithium; electrolytes containing sulfonyl-type
 Li salts and sulfolane or sultone analogs for nonaq. batteries)
 IT Aluminum alloy
 RL: DEV (Device component use); USES (Uses)
 (current collectors in cathodes; electrolytes containing
 sulfonyl-type Li salts and sulfolane or sultone analogs for
 nonaq. batteries)
 IT 7429-90-5, Aluminum, uses
 RL: DEV (Device component use); USES (Uses)
 (current collectors in cathodes; electrolytes containing
 sulfonyl-type Li salts and sulfolane or sultone analogs for
 nonaq. batteries)
 IT 90076-65-6, Lithium bis(trifluoromethylsulfonyl)imide
 RL: DEV (Device component use); USES (Uses)
 (electrolytes; electrolytes containing sulfonyl-type Li salts and
 sulfolane or sultone analogs for nonaq. batteries)
 IT 126-33-0, Sulfolane 1120-71-4D, Propane sultone, derivs.
 RL: DEV (Device component use); USES (Uses)
 (solvents; electrolytes containing sulfonyl-type Li salts and
 sulfolane or sultone analogs for nonaq. batteries)

L132 ANSWER 16 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1999:460492 HCAPLUS Full-text
 DOCUMENT NUMBER: 131:90284
 TITLE: Flame-resistant organic electrolytes for
 nonaqueous secondary battery
 INVENTOR(S): Usami, Kyohei; Ito, Miho; Kubota, Naohiro;
 Mashimo, Shinya
 PATENT ASSIGNEE(S): Denso Corporation, Japan; Asahi Denka Kogyo
 Kabushiki Kaisha
 SOURCE: Fr. Demande, 19 pp.
 CODEN: FRXXBL
 DOCUMENT TYPE: Patent
 LANGUAGE: French
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

10/658,272-266144-EIC 1700 SEARCH

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|-------------------|
| FR 2772390 | A1 | 19990618 | FR 1998-15228 | 1998 1202 |
| | | | <-- | |
| FR 2772390 | B1 | 20010302 | | |
| JP 11233141 | A | 19990827 | JP 1998-342065 | 1998 1201 |
| | | | <-- | |
| US 6210840 | B1 | 20010403 | US 1998-201667 | 1998 1201 |
| | | | <-- | |
| PRIORITY APPLN. INFO.: | | | JP 1997-331538 | A 1997 1202 |
| | | | <-- | |

OTHER SOURCE(S): MARPAT 131:90284

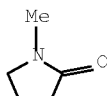
ED Entered STN: 28 Jul 1999

AB Flame-resistant electrolytes are described for use in secondary batteries, especially secondary lithium batteries with high energy d., comprising an organic solvent containing a salt and 5-100 weight% of a phosphonate or phosphinate of general formula (R1)_nP:O(OR2)_m, where R1 is C1-8-alkyl, alkyl halide, aryl, aralkyl, or -CH2COOR3 (R3 is C1-8-alkyl or alkyl halide); R2 is Me, Et, C1-8-alkyl halide; m,n=1,2; m+n=3. The organic solvents can be carbonates (e.g., ethylene carbonate and di-Et carbonate), lactones, ethers, sulfolanes or dioxolanes and the salts can be LiPF6, LiBF4, LiClO4, LiAsF6, LiSO3CF3, LiN(CF3SO2)2, LiC(CF3SO2)3.

IT 872-50-4, N-Methyl-2-pyrrolidone, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (nonflammable organic electrolytes for nonaq. secondary battery)

RN 872-50-4 HCAPLUS

CN 2-Pyrrolidinone, 1-methyl- (CA INDEX NAME)



IT 126-33-0, Sulfolane 7791-03-9 14283-07-9
 , Lithium tetrafluoroborate LiBF4 21324-40-3, Lithium hexafluorophosphate LiPF6 29935-35-1, Lithium hexafluoroarsenate LiAsF6 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6, Lithium bis(trifluoromethylsulfonyl)amide
 RL: NUU (Other use, unclassified); USES (Uses)
 (nonflammable organic electrolytes for nonaq. secondary battery)

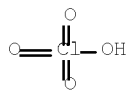
RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)

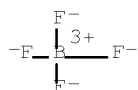


10/658,272-266144-EIC 1700 SEARCH

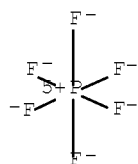
RN 7791-03-9 HCAPLUS
CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



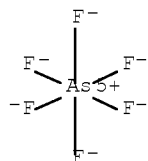
RN 14283-07-9 HCAPLUS
CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



RN 21324-40-3 HCAPLUS
CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)

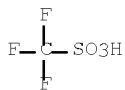


RN 29935-35-1 HCAPLUS
CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)

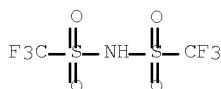


10/658,272-266144-EIC 1700 SEARCH

RN 33454-82-9 HCAPLUS
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



IC ICM C09K021-12
 ICS H01M002-00
 ICA C07F009-02
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST electrolyte flame resistant nonaq secondary battery; battery secondary nonflammable nonaq electrolyte; lithium secondary battery nonflammable nonaq electrolyte; safety nonflammable secondary battery electrolyte
 IT Secondary batteries
 (lithium; nonflammable organic electrolytes for nonaq. secondary battery)
 IT Battery electrolytes
 Fire-resistant materials
 Safety
 Secondary batteries
 (nonflammable organic electrolytes for nonaq. secondary battery)
 IT Fluoropolymers, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (nonflammable organic electrolytes for nonaq. secondary battery)
 IT Carbonates, uses
 Ethers, uses
 Lactones
 RL: NUU (Other use, unclassified); USES (Uses)
 (nonflammable organic electrolytes for nonaq. secondary battery)
 IT Solvents
 (organic; nonflammable organic electrolytes for nonaq. secondary battery)
 IT 7440-50-8, Copper, uses

10/658,272-266144-EIC 1700 SEARCH

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(anode; nonflammable organic electrolytes for nonaq. secondary battery)

IT 7429-90-5, Aluminum, uses 12190-79-3, Lithium cobalt oxide LiCoO2

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(cathode; nonflammable organic electrolytes for nonaq. secondary battery)

IT 872-50-4, N-Methyl-2-pyrrolidone, uses 7782-42-5, Graphite, uses 24937-79-9

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(nonflammable organic electrolytes for nonaq. secondary battery)

IT 649-68-3 650-16-8 683-08-9, Diethylmethane phosphonate 756-79-6, Dimethylmethane phosphonate 757-95-9 867-13-0 2240-41-7, Dimethylbenzene phosphonate 6163-75-3, Dimethylethane phosphonate 14337-77-0, Phosphinic acid, dimethyl-, methyl ester 71544-99-5 130522-75-7, Phosphonic acid, methylphenyl, Dimethyl ester 230310-88-0

RL: MOA (Modifier or additive use); USES (Uses)

(nonflammable organic electrolytes for nonaq. secondary battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

126-33-0, Sulfolane 646-06-0, Dioxolane

7791-03-9 14283-07-9, Lithium tetrafluoroborate

LiBF4 21324-40-3, Lithium hexafluorophosphate LiPF6

29935-35-1, Lithium hexafluoroarsenate LiAsF6

33454-82-9, Lithium trifluoromethanesulfonate

90076-65-6, Lithium bis(trifluoromethylsulfonyl)amide

132404-42-3, Lithium tris(trifluoromethylsulfonyl)methanide

RL: NUU (Other use, unclassified); USES (Uses)

(nonflammable organic electrolytes for nonaq. secondary battery)

IT 9003-07-0, Polypropylene

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(separator; nonflammable organic electrolytes for nonaq. secondary battery)

L132 ANSWER 17 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:224763 HCAPLUS Full-text

DOCUMENT NUMBER: 130:225404

TITLE: Nonaqueous electrolyte batteries

INVENTOR(S): Sato, Tomohiro; Mori, Shoichiro; Deshamps, Marc; Kotato, Minoru; Shima, Noriko; Suzuki, Hitoshi

PATENT ASSIGNEE(S): Mitsubishi Chemical Corporation, Japan

SOURCE: PCT Int. Appl., 39 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------|------|----------|-----------------|--------------|
| ----- | ---- | ----- | ----- | |
| WO 9916144 | A1 | 19990401 | WO 1998-JP4181 | 1998 0917 |

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W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD,

10/658,272-266144-EIC 1700 SEARCH

MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG,
 SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW
 RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE,
 DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF,
 BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
 JP 2002216841 A 20020802 JP 1997-278626

1997
 1013

<--

JP 4085450 B2 20080514
 JP 2002216850 A 20020802 JP 1998-111794

1998
 0422

<--

AU 9890951 A 19990412 AU 1998-90951

1998
 0917

<--

JP 11162511 A 19990618 JP 1998-263140

1998
 0917

<--

JP 3658506 B2 20050608
 EP 1030399 A1 20000823 EP 1998-943020

1998
 0917

<--

R: DE
 CN 1134083 C 20040107 CN 1998-811216

1998
 0917

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US 6670078 B1 20031230 US 2000-508108

2000
 0719

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PRIORITY APPLN. INFO.: JP 1997-254802 A

1997
 0919

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JP 1997-278626 A

1997
 1013

<--

JP 1998-111794 A

1998
 0422

<--

WO 1998-JP4181 W

1998
 0917

<--

OTHER SOURCE(S): MARPAT 130:225404

ED Entered STN: 12 Apr 1999

AB The batteries have a Li anode, a cathode, a nonaq. electrolyte containing a solute and an organic solvent, a separator, and a battery case; where the solvent contains a compound RAR' [R and R' are (aryl- or halogen-substituted) alkyl group or (alkyl- or halogen-substituted) aryl group; A = -OSO2-, -SO2-, -SO3-, or -SO4-; and R, R', and A may form a ring], and the cathode collector and the cathode side of the battery case contacting the electrolyte are composed of a metal, which forms a passivation film in electrolyte, or its alloy.

IT 77-79-2, Sulfolene 96-48-0, γ -
 Butyrolactone 109-99-9, Thf, uses 126-33-0,
 Sulfolane
 RL: DEV (Device component use); USES (Uses)
 (electrolyte solvents in lithium

10/658,272-266144-EIC 1700 SEARCH

batteries with readily passivated metals for
cathode collectors and battery case linings)

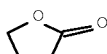
RN 77-79-2 HCAPLUS

CN Thiophene, 2,5-dihydro-, 1,1-dioxide (CA INDEX NAME)



RN 96-48-0 HCAPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



RN 109-99-9 HCAPLUS

CN Furan, tetrahydro- (CA INDEX NAME)



RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M010-40

ICS H01M004-64; H01M004-66

CC 52-2 (Electrochemical, Radiational, and Thermal Energy
Technology)

ST lithium battery electrolyte solvent
organosulfur compd; cathode collector compn
lithium battery; metal compn lithium
battery case

IT Battery electrolytes
(electrolyte solvents in lithium
batteries with readily passivated metals for
cathode collectors and battery case linings)

IT Secondary batteries
(lithium; secondary lithium
batteries with readily passivated metals for
cathode collectors and battery case linings)

IT Battery cathodes
(secondary lithium batteries with
readily passivated metals for cathode collectors and
battery case linings)

IT 77-79-2, Sulfolene 96-48-0, γ -

10/658,272-266144-EIC 1700 SEARCH

Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 109-99-9, Thf, uses 126-33-0, Sulfolane 554-12-1, Methyl propionate 616-42-2, Dimethyl sulfite 1120-71-4, 1,3-Propanesultone 3741-38-6, Ethylene sulfite

RL: DEV (Device component use); USES (Uses)

(electrolyte solvents in lithium batteries with readily passivated metals for cathode collectors and battery case linings)

IT 7429-90-5, Aluminum, uses 7440-03-1, Niobium, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-58-6, Hafnium, uses 7440-67-7, Zirconium, uses

RL: DEV (Device component use); USES (Uses)

(secondary lithium batteries with readily passivated metals for cathode collectors and battery case linings)

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L132 ANSWER 18 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:175852 HCAPLUS Full-text

DOCUMENT NUMBER: 130:198791

TITLE: Rechargeable lithium battery with organic electrolyte and carbon anode

INVENTOR(S): Jehoulet, Christophe; Moteau, Cecile

PATENT ASSIGNEE(S): Alcatel, Fr.

SOURCE: Eur. Pat. Appl., 11 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: French

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------|------|----------|-----------------|--------------|
| EP 901180 | A1 | 19990310 | EP 1998-402068 | 1998 0817 |

<--

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO

| | | | | |
|------------|----|----------|---------------|--------------|
| FR 2767969 | A1 | 19990305 | FR 1997-10822 | 1997 0829 |
|------------|----|----------|---------------|--------------|

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| | | | | |
|-------------|----|----------|----------------|--------------|
| FR 2767969 | B1 | 19991015 | | |
| JP 11126632 | A | 19990511 | JP 1998-241586 | 1998 0827 |

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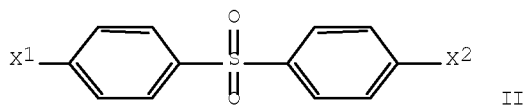
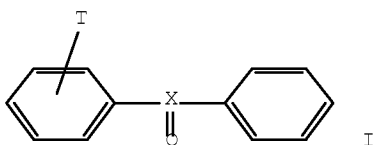
PRIORITY APPLN. INFO.: FR 1997-10822 A 1997
0829

<--

OTHER SOURCE(S): MARPAT 130:198791

ED Entered STN: 17 Mar 1999

GI



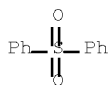
AB The Li secondary battery contains a Li cathode, a C anode, and an electrolyte containing a Li salt, ≥ 1 organic solvent, and an additive. The additive is an organic compound containing a X atom connected to ≥ 1 O atom or X-O bonds electronically conjugated with ≥ 1 unsatd. bond. The compound has a general formula (I) or (II) (X = S, C; T, X1, X2 = H, R, OH, OR, NH2, NHR, SH, SR, I, F, Cl, Br; R = C1-6 alkyl; T is in the ortho- or para- position).

IT 127-63-9, Diphenyl sulfone

RL: MOA (Modifier or additive use); USES (Uses)
(in electrolyte for lithium secondary batteries)

RN 127-63-9 HCAPLUS

CN Benzene, 1,1'-sulfonylbis- (CA INDEX NAME)



IT 96-48-0, γ -Butyrolactone 109-99-9, uses

126-33-0, Sulfolane 872-50-4,

N-Methylpyrrolidone, uses 7791-03-9, Lithium

perchlorate 14283-07-9, Lithium

tetrafluoroborate 21324-40-3, Lithium

hexafluorophosphate 29935-35-1, Lithium

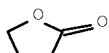
hexafluoroarsenate 33454-82-9, Lithium

trifluoromethanesulfonate 90076-65-6

RL: TEM (Technical or engineered material use); USES (Uses)
(in electrolyte for lithium secondary batteries)

RN 96-48-0 HCAPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



RN 109-99-9 HCAPLUS

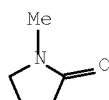
CN Furan, tetrahydro- (CA INDEX NAME)



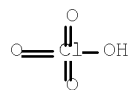
RN 126-33-0 HCAPLUS
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



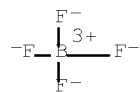
RN 872-50-4 HCAPLUS
 CN 2-Pyrrolidinone, 1-methyl- (CA INDEX NAME)



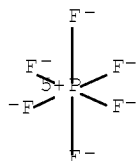
RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



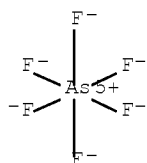
RN 14283-07-9 HCAPLUS
 CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



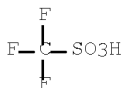
RN 21324-40-3 HCAPLUS
 CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



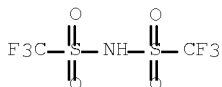
RN 29935-35-1 HCAPLUS
 CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



RN 33454-82-9 HCAPLUS
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

10/658,272-266144-EIC 1700 SEARCH

ST battery electrolyte additive; lithium battery
electrolyte additive carbon anode

IT Battery electrolytes
(additive for)

IT Secondary batteries
(lithium; rechargeable lithium
battery with organic electrolyte and carbon anode)

IT 127-63-9, Diphenyl sulfone 945-51-7, Diphenyl sulfoxide
RL: MOA (Modifier or additive use); USES (Uses)
(in electrolyte for lithium
secondary batteries)

IT 67-68-5, Dimethylsulfoxide, uses 68-12-2, Dimethylformamide,
uses 75-05-8, Acetonitrile, uses 75-56-9, uses 79-16-3,
N-Methylacetamide 96-48-0, γ -Butyrolactone
96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
108-32-7, Propylene carbonate 109-99-9, uses 123-39-7,
N-Methylformamide 126-33-0, Sulfolane 616-38-6,
Dimethyl carbonate 616-42-2, Dimethyl sulfite 623-96-1,
Dipropyl carbonate 646-06-0, 1,3-Dioxolane 372-50-4,
N-Methylpyrrolidone, uses 7791-03-9, Lithium
perchlorate 14283-07-9, Lithium
tetrafluoroborate 21324-40-3, Lithium
hexafluorophosphate 29935-35-1, Lithium
hexafluoroarsenate 33454-82-9, Lithium
trifluoromethanesulfonate 90076-65-6 133395-17-2
RL: TEM (Technical or engineered material use); USES (Uses)
(in electrolyte for lithium
secondary batteries)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

L132 ANSWER 19 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1993:675100 HCAPLUS Full-text

DOCUMENT NUMBER: 119:275100

ORIGINAL REFERENCE NO.: 119:49155a,49158a

TITLE: Batteries with solid polymer electrolytes

INVENTOR(S): Kono, Michiyuki; Mori, Shigeo; Takeda,
Kazunari; Izuti, Shyuiti

PATENT ASSIGNEE(S): Daiichi Kogyo Seiyaku Co., Ltd., Japan; Yuasa
Corp.

SOURCE: PCT Int. Appl., 29 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|------|----------|-----------------|--------------|
| WO 9314529 | A1 | 19930722 | WO 1993-JP64 | 1993 0120 |
| <-- | | | | |
| W: CA, US | | | | |
| RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE | | | | |
| JP 05198303 | A | 19930806 | JP 1992-31451 | 1992 0121 |
| <-- | | | | |
| EP 576686 | A1 | 19940105 | EP 1993-902505 | 1993 0120 |
| <-- | | | | |

10/658,272-266144-EIC 1700 SEARCH

EP 576686 B1 20011010
 R: DE, FR, GB
 JP 07006787 A 19950110 JP 1993-26269
 1993
 0120

JP 3290229 B2 20020610
 CA 2106205 C 19991214 CA 1993-2106205
 1993
 0120

US 5436090 A 19950725 US 1993-119214
 1993
 0921

PRIORITY APPLN. INFO.: JP 1992-31451 A
 1992
 0121

WO 1993-JP64 W
 1993
 0120

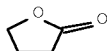
ED Entered STN: 25 Dec 1993

AB The batteries use electrolytes obtained by crosslinking a mixture containing a trifunctional group polymer, an electrolyte salt, and a solvent by energy beam irradiation and/or heating; where the polymer contains 3 functional polymer chains of (CH₂CH₂O)_m(CH₂CRHO)_nCOCR1:CH₂ (R = C1-6 alkyl group, R1 = H or Me, m + n ≥ 35, and m or n may be 0), and the solvent is used at 220-950% the weight of the polymer. The batteries may use the electrolyte as separators and cathodes containing the electrolyte, or use anodes containing the electrolyte.

IT 96-48-0, γ-Butyrolactone 126-33-0,
 Sulfolan
 RL: USES (Uses)
 (electrolytes containing lithium salts
 and polyglycol triacrylates and, for batteries)

RN 96-48-0 HCAPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)

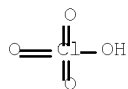


IT 7791-03-9, Lithium perchlorate
 14283-07-9, Lithium fluoroborate
 33454-82-9, Lithium trifluoromethanesulfonate

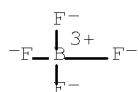
RL: USES (Uses)
 (electrolytes containing polyglycol triacrylates and
 solvents and, for batteries)

RN 7791-03-9 HCAPLUS

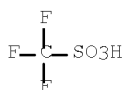
CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



RN 14283-07-9 HCAPLUS
CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



RN 33454-82-9 HCAPLUS
CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST battery polyglycol triacrylate solid electrolyte; cathode polyglycol triacrylate electrolyte battery; anode polyglycol triacrylate electrolyte battery
IT Battery electrolytes
(lithium salt-crosslinked polyglycol triacrylate-organic solvent)
IT Cathodes
(battery, crosslinked polymer electrolyte-containing)
IT 1313-13-9, Manganese dioxide, uses 25233-30-1, Polyaniline
RL: USES (Uses)
(cathodes, containing crosslinked polymer electrolytes for batteries)
IT 52408-84-1 101661-95-4 111804-95-6 150604-31-2 150604-34-5
150604-35-6 151614-89-0
RL: USES (Uses)
(crosslinked, electrolyte containing lithium salts and solvents and, for batteries)
IT 96-48-0, γ -Butyrolactone 96-49-1,
1,3-Dioxolan-2-one 110-71-4, 1,2-Dimethoxyethane
126-33-0, Sulfolan

10/658,272-266144-EIC 1700 SEARCH

RL: USES (Uses)

(electrolytes containing lithium salts
and polyglycol triacrylates and, for batteries)IT 556-65-0, Lithium thiocyanate 7791-03-9,
Lithium perchlorate 14283-07-9, Lithium
fluoroborate 33454-82-9, Lithium
trifluoromethanesulfonate

RL: USES (Uses)

(electrolytes containing polyglycol triacrylates and
solvents and, for batteries)

L132 ANSWER 20 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1993:452877 HCAPLUS Full-text

DOCUMENT NUMBER: 119:52877

ORIGINAL REFERENCE NO.: 119:9521a,9524a

TITLE: Nonaqueous electrolytes for high-energy
batteries

INVENTOR(S): Webber, Andrew

PATENT ASSIGNEE(S): Eveready Battery Co., USA

SOURCE: Eur. Pat. Appl., 7 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|-------------------|
| ----- | ---- | ----- | ----- | |
| EP 529802 | A1 | 19930303 | EP 1992-306734 | 1992 0723 |
| | | | <-- | |
| EP 529802 | B1 | 20000419 | | |
| R: BE, FR, GB | | | | |
| CA 2072488 | A1 | 19930214 | CA 1992-2072488 | 1992 0626 |
| | | | <-- | |
| CA 2072488 | C | 20021001 | | |
| JP 05198315 | A | 19930806 | JP 1992-223146 | 1992 0710 |
| | | | <-- | |
| JP 3514478 | B2 | 20040331 | | |
| HK 1007409 | A1 | 20010803 | HK 1998-106326 | 1998 0624 |
| | | | <-- | |
| PRIORITY APPLN. INFO.: | | | US 1991-744179 | A 1991 0813 |
| | | | <-- | |

ED Entered STN: 07 Aug 1993

AB The electrolytes comprise a solute dissolved in a 1:99 to 45:55 (weight ratio) mixture
of a dioxolane-based and an acyclic ether solvent, and they contain <25 weight%
cosolvent. The dioxolane-based solvent is dioxolane; the acyclic ether is Et glyme,
diglyme, triglyme, and preferably DME; and the cosolvent is 3-methyl-2-oxazolidone,
propylene carbonate, ethylene carbonate, butylene carbonate, sulfolane, and/or
preferably 3,5-dimethylisoxazole. The preferred solute is LiCF₃SO₃, the anode of the
batteries is Li, and their cathode is selected from fluorinated C, a metal sulfide, a
metal oxide, and/or a metal chloride, and preferably FeS₂.

IT 126-33-0, Sulfolane

RL: USES (Uses)

(electrolyte solvent mixts. of DME-dioxolane-, for
lithium batteries)

RN 126-33-0 HCAPLUS

10/658,272-266144-EIC 1700 SEARCH

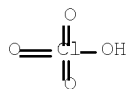
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IT 7791-03-9, Lithium perchlorate
 29935-35-1, Lithium hexafluoroarsenate
 33454-82-9, Lithium trifluoromethanesulfonate
 90076-65-6
 RL: USES (Uses)
 (electrolytes containing solvent mixts. and, for
 lithium batteries)

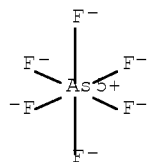
RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



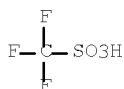
RN 29935-35-1 HCAPLUS

CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



RN 33454-82-9 HCAPLUS

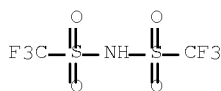
CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS

10/658,272-266144-EIC 1700 SEARCH

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-
 , lithium salt (1:1) (CA INDEX NAME)



● Li

IC ICM H01M006-16
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium battery nonaq
 electrolyte solvent; dioxolane acyclic ether
 electrolyte solvent; DME dioxolane battery electrolyte solvent;
 dimethylisoxazole DME dioxolane
 IT Battery electrolytes
 (dioxolane-acyclic ether solvent mixts. for lithium)
 IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate
 126-33-0, Sulfolane 300-87-8, 3,5-Dimethylisoxazole
 4437-85-8, Butylene carbonate 19836-78-3
 RL: USES (Uses)
 (electrolyte solvent mixts. of DME-dioxolane-, for
 lithium batteries)
 IT 646-06-0, Dioxolane
 RL: USES (Uses)
 (electrolyte solvent mixts. of acyclic ether-dimethylisoxazole-
 , for lithium batteries)
 IT 110-71-4 111-96-6, Diglyme 112-49-2, Triglyme
 RL: USES (Uses)
 (electrolyte solvent mixts. of dioxolane-dimethylisoxazole-,
 for lithium batteries)
 IT 7791-03-9, Lithium perchlorate
 29935-35-1, Lithium hexafluoroarsenate
 33454-32-9, Lithium trifluoromethanesulfonate
 90076-65-6
 RL: USES (Uses)
 (electrolytes containing solvent mixts. and, for
 lithium batteries)

L132 ANSWER 21 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1991:517773 HCAPLUS Full-text
 DOCUMENT NUMBER: 115:117773
 ORIGINAL REFERENCE NO.: 115:20143a,20146a
 TITLE: Nonaqueous secondary battery
 INVENTOR(S): Eisenberg, Morris
 PATENT ASSIGNEE(S): Electrochimica Corp., USA
 SOURCE: U.S., 3 pp.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------|------|----------|-----------------|--------------|
| ----- | ---- | ----- | ----- | |
| US 5024906 | A | 19910618 | US 1990-586295 | 1990 0921 |

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10/658,272-266144-EIC 1700 SEARCH

PRIORITY APPLN. INFO.:

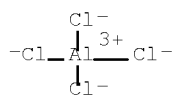
US 1990-586295

1990

0921

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ED Entered STN: 23 Sep 1991
 AB An ionizing solvent of SO₂ and Me chloroformate, Et chloroformate, and/or sulfolane is added to an electrolyte containing a Lewis acid salt of an active metal anode. The addition of the solvent to the electrolyte prevents freezing of the electrolyte and increases battery performance and cathode capacity utilization.
 IT 14024-11-4, Lithium aluminum chloride (LiAlCl₄)
 RL: USES (Uses)
 (electrolyte containing alkyl chloroformate or sulfolane and sulfur dioxide and, for batteries)
 RN 14024-11-4 HCAPLUS
 CN Aluminate(1-), tetrachloro-, lithium (1:1), (T-4)- (CA INDEX NAME)



IT 126-33-0, Sulfolane
 RL: USES (Uses)
 (electrolyte containing lithium salt and sulfur dioxide and, for batteries)
 RN 126-33-0 HCAPLUS
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M010-40
 INCL 429101000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST electrolyte solvent nonaq battery; methyl chloroformate battery electrolyte; ethyl chloroformate battery electrolyte; sulfolane battery electrolyte; sulfur dioxide battery electrolyte
 IT Batteries, secondary
 (lithium-copper chloride, with electrolyte containing alkyl chloroformate or sulfolane and lithium salt and sulfur dioxide, performance of)
 IT 7446-09-5, Sulfur dioxide, uses and miscellaneous
 RL: USES (Uses)
 (electrolyte containing alkyl chloroformate or sulfolane and lithium salt and, for batteries)
 IT 14024-11-4, Lithium aluminum chloride (LiAlCl₄)
 15138-76-8 15955-98-3
 RL: USES (Uses)
 (electrolyte containing alkyl chloroformate or sulfolane and sulfur dioxide and, for batteries)
 IT 79-22-1, Methyl chloroformate 126-33-0, Sulfolane

10/658,272-266144-EIC 1700 SEARCH

541-41-3, Ethyl chloroformate

RL: USES (Uses)

(electrolyte containing lithium salt
and sulfur dioxide and, for batteries)

L132 ANSWER 22 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1991:453399 HCAPLUS Full-text

DOCUMENT NUMBER: 115:53399

ORIGINAL REFERENCE NO.: 115:9221a,9224a

TITLE: Nonaqueous-electrolyte secondary
batteriesINVENTOR(S): Takami, Norio; Ohsaki, Takahisa; Inada,
Kuniaki; Kurisu, Norihito; Yamada, Shuji;
Takabayashi, JunichiPATENT ASSIGNEE(S): Toshiba Corp., Japan; Toshiba Battery Co.,
Ltd.

SOURCE: Eur. Pat. Appl., 13 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. ----- | KIND ---- | DATE ----- | APPLICATION NO. ----- | DATE |
|------------------------|--------------|---------------|--------------------------|-------------------|
| EP 398689 | A2 | 19901122 | EP 1990-305300 | 1990 0516 |
| | | | <-- | |
| EP 398689 | A3 | 19920527 | | |
| EP 398689 | B1 | 19950816 | | |
| R: DE, FR, GB | | | | |
| JP 03049165 | A | 19910301 | JP 1989-184245 | 1989 0717 |
| | | | <-- | |
| JP 03074061 | A | 19910328 | JP 1989-215594 | 1989 0822 |
| | | | <-- | |
| JP 3017756 | B2 | 20000313 | | |
| JP 03078976 | A | 19910404 | JP 1989-215593 | 1989 0822 |
| | | | <-- | |
| CA 2016777 | A1 | 19901116 | CA 1990-2016777 | 1990 0515 |
| | | | <-- | |
| CA 2016777 | C | 19931012 | | |
| US 5079109 | A | 19920107 | US 1990-523569 | 1990 0515 |
| | | | <-- | |
| JP 03250565 | A | 19911108 | JP 1990-193840 | 1990 0724 |
| | | | <-- | |
| JP 3128230 | B2 | 20010129 | | |
| PRIORITY APPLN. INFO.: | | | JP 1989-122604 | A 1989 0516 |
| | | | <-- | |
| | | | JP 1989-215594 | A 1989 0822 |

10/658,272-266144-EIC 1700 SEARCH

<--
 JP 1989-184245 A 1989
 0717
 <--
 JP 1989-215592 A 1989
 0822
 <--
 JP 1989-215593 A 1989
 0822
 <--
 JP 1990-2557 1990
 0111
 <--

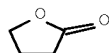
ED Entered STN: 10 Aug 1991

AB The batteries comprise a Li-containing cathode housed in a case, a Li anode arranged in the case so that a separator is sandwiched between the anode and cathode, and a nonaq. electrolyte. The electrolyte is prepared by dissolving an electrolytic salt (e.g., LiPF₆ or LiBF₄) in a solvent mixture comprising ethylene carbonate, 2-methyltetrahydrofuran, and ≥1 ester- and/or ether-based nonaq. solvents. Batteries using these electrolyte solvent mixts. have large capacity and long charge/discharge cycle life.

IT 96-48-0, γ-Butyrolactone 109-99-9,
 Tetrahydrofuran, uses and miscellaneous 126-33-0,
 Sulfolane 534-22-5, 2-Methylfuran
 RL: USES (Uses)
 (electrolyte solvent containing ethylene carbonate and
 methyltetrahydrofuran and, for lithium
 batteries)

RN 96-48-0 HCAPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



RN 109-99-9 HCAPLUS

CN Furan, tetrahydro- (CA INDEX NAME)



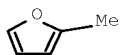
RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)

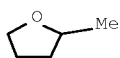


RN 534-22-5 HCAPLUS

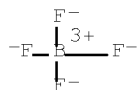
CN Furan, 2-methyl- (CA INDEX NAME)



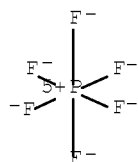
IT 96-47-9, 2-Methyltetrahydrofuran
 RL: USES (Uses)
 (electrolyte solvent containing, esters and ethers in, for
 lithium batteries)
 RN 96-47-9 HCAPLUS
 CN Furan, tetrahydro-2-methyl- (CA INDEX NAME)



IT 14283-07-9 21324-40-3
 RL: USES (Uses)
 (electrolyte, solvent mixts. for, for secondary
 batteries)
 RN 14283-07-9 HCAPLUS
 CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



RN 21324-40-3 HCAPLUS
 CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)
 ST lithium battery electrolyte solvent
 mixt; ethylene carbonate electrolyte solvent battery;
 methyltetrahydrofuran electrolyte solvent
 lithium battery; ester electrolyte solvent

10/658,272-266144-EIC 1700 SEARCH

battery; ether electrolyte solvent battery

IT Esters, uses and miscellaneous
Ethers, uses and miscellaneous
RL: USES (Uses)
(electrolyte solvent containing ethylene carbonate and
methyltetrahydrofuran and, for lithium
batteries)

IT Batteries, secondary
(lithium-manganese dioxide, nonaq. electrolytes for)

IT 96-48-0, γ -Butyrolactone 108-32-7, Propylene
carbonate 109-99-9, Tetrahydrofuran, uses and
miscellaneous 110-71-4, 1,2-Dimethoxyethane 126-33-0,
Sulfolane 534-22-5, 2-Methylfuran 616-38-6, Dimethyl
carbonate 629-14-1 646-06-0, 1,3-Dioxolane 4437-85-8,
Butylene carbonate 17081-21-9, 1,3-Dimethoxypropane
RL: USES (Uses)
(electrolyte solvent containing ethylene carbonate and
methyltetrahydrofuran and, for lithium
batteries)

IT 96-47-9, 2-Methyltetrahydrofuran 96-49-1, Ethylene
carbonate
RL: USES (Uses)
(electrolyte solvent containing, esters and ethers in, for
lithium batteries)

IT 14283-07-9 21324-40-3
RL: USES (Uses)
(electrolyte, solvent mixts. for, for secondary
batteries)

L132 ANSWER 23 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1990:555874 HCAPLUS Full-text

DOCUMENT NUMBER: 113:155874

ORIGINAL REFERENCE NO.: 113:26457a,26460a

TITLE: Preparation of ion-conductive solid
electrolyte and its use in lithium
batteriesINVENTOR(S): Takahashi, Toru; Shimizu, Ryuichi; Suehiro,
Tsutomu; Ashitaka, Hidetomo

PATENT ASSIGNEE(S): Japan

SOURCE: U.S., 7 pp. Cont.-in-part of U.S. Ser. No.
106,641.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 5

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|-------------|------|----------|-----------------|--------------|
| ----- | ---- | ----- | ----- | |
| US 4908283 | A | 19900313 | US 1989-342122 | 1989 0424 |
| | | | <-- | |
| JP 63094501 | A | 19880425 | JP 1986-239041 | 1986 1009 |
| | | | <-- | |
| JP 03073081 | B | 19911120 | | |
| JP 63094563 | A | 19880425 | JP 1986-239042 | 1986 1009 |
| | | | <-- | |
| JP 63135477 | A | 19880607 | JP 1986-281148 | 1986 1126 |

10/658,272-266144-EIC 1700 SEARCH

JP 06096699 B 19941130
 JP 63181259 A 19880726 JP 1987-12273
 1987
 0123

JP 05063905 B 19930913
 PRIORITY APPLN. INFO.: JP 1986-239041 A
 1986
 1009

JP 1986-239042 A
 1986
 1009

JP 1986-281148 A
 1986
 1126

JP 1987-12273 A
 1987
 0123

US 1987-106641 A2
 1987
 1008

ED Entered STN: 27 Oct 1990

AB The electrolyte is prepared by curing a composition of an acryloyl-terminated polyoxyalkylene of mol. weight 200-3000, 0.05-50 mol% inorg. salt, and 200 weight% organic solvent by irradiation with active rays (high-pressure Hg lamp). The acryloyl-terminated polyoxyalkylene comprises CH(R1)C(R2)O2 and (CH2CHR2O)n, where R and R2 are H or C1-6 alkyl, R1 is H or an aromatic group, and n is an integer of 1-30. The salt is a Li, Na, K, Cs, Ag, Cu, or Mg salt and the solvent is selected from propylene carbonate, butyrolactone, ethylene carbonate, THF, MeCN, DME, DMSO, dioxolane, and sulfolane. A solid-electrolyte battery uses a Li or Li alloy anode and a cathode of a cured product of a cathode active material (MnO2) and the electrolyte. The ion conductivities of the LiClO4-containing invention electrolyte films at .apprx.20° were 5.9 + 10-5 to 1.1 + 10-7 S/cm.

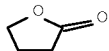
IT 96-48-0, γ -Butyrolactone

RL: USES (Uses)

(electrolytes containing acryloyl-terminated polyoxyalkylene and inorg. compds. and, for batteries)

RN 96-48-0 HCAPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



IT 109-99-9, THF, uses and miscellaneous 126-33-0, Sulfolane

RL: TEM (Technical or engineered material use); USES (Uses)

(electrolytes containing acryloyl-terminated polyoxyalkylene and inorg. compds. and, for batteries)

RN 109-99-9 HCAPLUS

CN Furan, tetrahydro- (CA INDEX NAME)

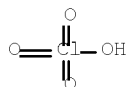


10/658,272-266144-EIC 1700 SEARCH

RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IT 7791-03-9
RL: TEM (Technical or engineered material use); USES (Uses)
(electrolytes containing acryloyl-terminated polyoxyalkylene and organic solvents and, for batteries)
RN 7791-03-9 HCAPLUS
CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



IC H01M006-18; H01M010-26
INCL 429192000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 35, 76
ST polyoxyalkylene acrylate battery electrolyte; lithium manganese dioxide battery electrolyte; manganese dioxide polyoxyalkylene acrylate cathode; elec cond polyoxyalkylene acrylate electrolyte; lithium perchlorate polyoxyalkylene acrylate electrolyte
IT Polyoxyalkylenes, compounds
RL: TEM (Technical or engineered material use); USES (Uses)
(acrylates, polymers, electrolytes containing organic solvents and lithium salts and, for batteries)
IT Batteries, primary
Batteries, secondary
(lithium-manganese dioxide, electrolytes containing acryloyl-terminated polyoxyalkylene and lithium salt and organic solvent for)
IT Cathodes
(battery, manganese dioxide, containing acryloyl-terminated polyoxyalkylene and lithium salt and organic solvents)
IT Electric conductivity and conduction
(ionic, of electrolytes contg acryloyl-terminated polyoxyalkylene and lithium salts and organic solvents, for batteries)
IT 1313-13-9, Manganese dioxide, uses and miscellaneous
RL: DEV (Device component use); USES (Uses)
(cathodes, containing acryloyl-terminated polyoxyalkylene-lithium salt electrolytes, for batteries)
IT 67-68-5, DMSO, uses and miscellaneous 75-05-8, Acetonitrile,

10/658,272-266144-EIC 1700 SEARCH

uses and miscellaneous 96-48-0, γ -Butyrolactone

96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate

RL: USES (Uses)

(electrolytes containing acryloyl-terminated polyoxyalkylene and inorg. compds. and, for batteries)

IT 109-99-9, THF, uses and miscellaneous 110-71-4

126-33-0, Sulfolane 646-06-0, Dioxolane

RL: TEM (Technical or engineered material use); USES (Uses)

(electrolytes containing acryloyl-terminated polyoxyalkylene and inorg. compds. and, for batteries)

IT 7791-03-9

RL: TEM (Technical or engineered material use); USES (Uses)

(electrolytes containing acryloyl-terminated polyoxyalkylene and organic solvents and, for batteries)

IT 7439-93-2D, Lithium, acryloyl-terminated polyoxyalkylene complexes

7439-95-4D, Magnesium, acryloyl-terminated polyoxyalkylene

complexes 7440-09-7D, Potassium, acryloyl-terminated

polyoxyalkylene complexes 7440-22-4D, Silver,

acryloyl-terminated polyoxyalkylene complexes 7440-23-5D,

Sodium, acryloyl-terminated polyoxyalkylene complexes

7440-46-2D, Cesium, acryloyl-terminated polyoxyalkylene complexes

7440-50-8D, Copper, acryloyl-terminated polyoxyalkylene complexes

129845-23-4D, lithium complexes

RL: TEM (Technical or engineered material use); USES (Uses)

(electrolytes, containing organic solvents, for batteries)

L132 ANSWER 24 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1988:64511 HCAPLUS Full-text

DOCUMENT NUMBER: 108:64511

ORIGINAL REFERENCE NO.: 108:10593a,10596a

TITLE: Oxidation potentials of electrolyte solutions for lithium cells

AUTHOR(S): Ossola, F.; Pistoia, G.; Seeber, R.; Ugo, P.

CORPORATE SOURCE: Ist. Chim. Tecol. Radioelem., C. N. R., Padova, Italy

SOURCE: Electrochimica Acta (1988), 33(1), 47-50

CODEN: ELCAAV; ISSN: 0013-4686

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 20 Feb 1988

AB The oxidation potentials, Eox of several solns. of interest for nonaq. Li cells were measured by linear sweep voltammetric expts. A correlation is found between Eox and the basicity of the solvents, expressed by their donor nos. (DN). Esters and sulfones have higher resistance to oxidation than ethers, which possess the highest DN values. All solns. had Eox > 4 V vs. Li/Li+. However, some reactivity between pos. electrodes and solns. was observed below this potential.

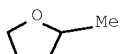
IT 96-47-9, 2-Methyltetrahydrofuran

RL: PRP (Properties)

(oxidation potential of electrolyte solns. of THF and, in lithium cells)

RN 96-47-9 HCAPLUS

CN Furan, tetrahydro-2-methyl- (CA INDEX NAME)



IT 126-33-0, Sulfolane

RL: PRP (Properties)

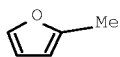
(oxidation potential of electrolyte solns. of benzene and, in lithium cells)

10/658,272-266144-EIC 1700 SEARCH

RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



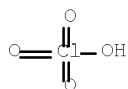
IT 534-22-5, 2-Methylfuran
RL: PRP (Properties)
(oxidation potential of electrolyte solns. of
methyltetrahydrofuran and THF and, in lithium cells)
RN 534-22-5 HCAPLUS
CN Furan, 2-methyl- (CA INDEX NAME)



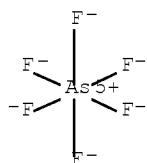
IT 109-99-9, properties
RL: PRP (Properties)
(oxidation potential of electrolyte solns. of methyltetrahydrofuran
and, in lithium cells)
RN 109-99-9 HCAPLUS
CN Furan, tetrahydro- (CA INDEX NAME)



IT 7791-03-9, Lithium perchlorate 29935-35-1
RL: PRP (Properties)
(oxidation potentials of electrolyte solns. for
lithium cells containing)
RN 7791-03-9 HCAPLUS
CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



RN 29935-35-1 HCAPLUS
CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



CC 72-2 (Electrochemistry)
 Section cross-reference(s): 23, 27, 52, 78
 ST lithium cell electrolyte oxidn potential
 IT Batteries, primary
 (lithium, oxidation of electrolyte solns. in)
 IT Nucleophilicity
 (oxidation potential of organic solvents in
 relation to)
 IT Cathodes
 (teflonized acetylene black, in lithium
 batteries)
 IT 96-47-9, 2-Methyltetrahydrofuran
 RL: PRP (Properties)
 (oxidation potential of electrolyte solns. of THF and, in lithium
 cells)
 IT 126-33-0, Sulfolane
 RL: PRP (Properties)
 (oxidation potential of electrolyte solns. of benzene and, in
 lithium cells)
 IT 534-22-5, 2-Methylfuran
 RL: PRP (Properties)
 (oxidation potential of electrolyte solns. of
 methyltetrahydrofuran and THF and, in lithium cells)
 IT 109-99-9, properties
 RL: PRP (Properties)
 (oxidation potential of electrolyte solns. of methyltetrahydrofuran
 and, in lithium cells)
 IT 7791-03-9, Lithium perchlorate 29935-35-1
 RL: PRP (Properties)
 (oxidation potentials of electrolyte solns. for
 lithium cells containing)

L132 ANSWER 25 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1987:537569 HCAPLUS Full-text

DOCUMENT NUMBER: 107:137569

ORIGINAL REFERENCE NO.: 107:22179a,22182a

TITLE: Electrochemical and structural characteristics
 of niobium(V) oxide in a rechargeable
 lithium battery

AUTHOR(S): Kumagai, N.; Ishiyama, I.; Tanno, K.

CORPORATE SOURCE: Fac. Eng., Iwate Univ., Morioka, 020, Japan

SOURCE: Journal of Power Sources (1987),
 20(3-4), 193-8
 CODEN: JPSODZ; ISSN: 0378-7753

DOCUMENT TYPE: Journal

LANGUAGE: English

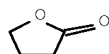
ED Entered STN: 17 Oct 1987

AB The discharge behavior of Nb2O5 in various electrolytes is unaffected by the choice of
 solvent, but is strongly dependent on the crystal radius of the solute cation species.
 Thermodyn. and structural studies show that this is due to the insertion of unsolvated
 Li+ into the crystal lattice. The graphite content of the Nb2O5 electrode has a marked
 influence on the cycling behavior on account of the decrease in the oxide conductivity
 with discharge. Furthermore, the chemical diffusion coefficient of Li+ ions in Nb2O5 is

10/658,272-266144-EIC 1700 SEARCH

.apprx.10-10 cm²/s, which is 1 order of magnitude smaller than that in V2O5 with a layered structure.

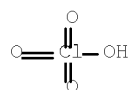
IT 96-48-0, Butyrolactone 126-33-0, Sulfolane
 RL: USES (Uses)
 (electrolytes, containing lithium perchlorate,
 niobium pentoxide cathode discharge in, in
 lithium batteries)
 RN 96-48-0 HCAPLUS
 CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



RN 126-33-0 HCAPLUS
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IT 7791-03-9, Lithium perchlorate
 RL: USES (Uses)
 (electrolytes, in organic solvents,
 niobium pentoxide cathode discharge in, in
 lithium batteries)
 RN 7791-03-9 HCAPLUS
 CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)
 Section cross-reference(s): 72
 ST lithium battery niobium pentoxide
 IT Diffusion
 (of lithium ion, in niobium pentoxide and
 vanadium pentoxide cathodes, of lithium
 batteries)
 IT Cathodes
 (battery, niobium pentoxide, with crystal structure of
 three-dimensional packing, electrochem. and structural
 characteristics of)
 IT 1314-62-1, Vanadium pentoxide, uses and miscellaneous
 RL: USES (Uses)
 (cathodes, lithium diffusion in, discharge capacity
 in relation to)
 IT 1313-96-8, Niobium pentoxide
 RL: USES (Uses)

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- (cathodes, with crystal structure of
three-dimensional packing, electrochem. and structural
characteristics of, for lithium batteries)
- IT 7439-93-2, Lithium, properties
RL: PEP (Physical, engineering or chemical process); PROC
(Process)
(diffusion of, in niobium pentoxide and vanadium pentoxide
cathodes, of lithium batteries)
- IT 67-68-5, DMSO, uses and miscellaneous 96-48-0,
Butyrolactone 108-32-7, Propylene carbonate 126-33-0,
Sulfolane
RL: USES (Uses)
(electrolytes, containing lithium perchlorate,
niobium pentoxide cathode discharge in, in
lithium batteries)
- IT 7791-03-9, Lithium perchlorate
RL: USES (Uses)
(electrolytes, in organic solvents,
niobium pentoxide cathode discharge in, in
lithium batteries)
- IT 7782-42-5, Graphite, uses and miscellaneous
RL: USES (Uses)
(niobium pentoxide cathodes containing, lithium
batteries, cycling performance in relation to)

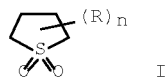
L132 ANSWER 26 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1984:539754 HCAPLUS Full-text
DOCUMENT NUMBER: 101:139754
ORIGINAL REFERENCE NO.: 101:21093a,21096a
TITLE: Polymer-electrode battery
PATENT ASSIGNEE(S): Showa Denko K. K., Japan; Hitachi, Ltd.
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|-------------|------|----------|-----------------|--------------|
| ----- | ---- | ----- | ----- | |
| JP 59042784 | A | 19840309 | JP 1982-152698 | 1982 0903 |

PRIORITY APPLN. INFO.: <--
JP 1982-152698
1982
0903

ED Entered STN: 13 Oct 1984
GI

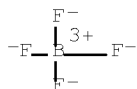


AB In a battery having an anode and cathode of a polymer with double bonds, I (R = H, C1-15 alkyl, or C6-15 aryl; and n = 0-4) is used as an organic solvent for an electrolyte. Alternatively, a conductive polymer from the doped polymer may be used as the anode and cathode. Thus, 3-methyltetrahydrothiophene 1,1-dioxide [872-93-5] is used as a

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solvent for LiBF₄ of a secondary battery having a polyacetylene anode and cathode .
The battery had a high energy d. and charge-discharge property.

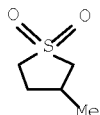
IT 14283-07-9
RL: PRP (Properties)
(electrolyte, in methyltetrahydrothiophene dioxide for
secondary battery with polyacetylene
electrodes)
RN 14283-07-9 HCAPLUS
CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



IT 126-33-00, derivs.
RL: PRP (Properties)
(solvent, for battery with polymer electrodes)
RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IT 872-93-5
RL: PRP (Properties)
(solvent, for lithium tetrahydroborate
electrolyte for secondary battery
with polyacetylene electrodes)
RN 872-93-5 HCAPLUS
CN Thiophene, tetrahydro-3-methyl-, 1,1-dioxide (CA INDEX NAME)



IC H01M010-40
ICA H01M004-36
CC 72-3 (Electrochemistry)
ST hydrothiophene oxide solvent secondary battery
IT Batteries, secondary
(nonaq., with polymer electrodes and tetrahydrothiophene
dioxide derivs. as solvent)
IT 25067-58-7
RL: PRP (Properties)
(electrodes, in battery with Me tetrahydrothiophene dioxide
solvent and lithium fluoroborate electrolyte
)
IT 25190-62-9 51325-05-4

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RL: PRP (Properties)
 (electrodes, in secondary battery with
 solvent from tetrahydrothiophene dioxide derivs.)

IT 14283-07-9
 RL: PRP (Properties)
 (electrolyte, in methyltetrahydrothiophene dioxide for
 secondary battery with polyacetylene
 electrodes)

IT 126-33-00, derivs.
 RL: PRP (Properties)
 (solvent, for battery with polymer electrodes)

IT 872-93-5
 RL: PRP (Properties)
 (solvent, for lithium tetrahydroborate
 electrolyte for secondary battery
 with polyacetylene electrodes)

L132 ANSWER 27 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1983:460825 HCAPLUS Full-text
 DOCUMENT NUMBER: 99:60825
 ORIGINAL REFERENCE NO.: 99:9361a,9364a
 TITLE: Electrochemistry of a nonaqueous
 lithium/sulfur cell
 AUTHOR(S): Yamin, H.; Peled, E.
 CORPORATE SOURCE: Dep. Chem., Tel-Aviv Univ., Tel Aviv Jaffa,
 69978, Israel
 SOURCE: Journal of Power Sources (1983),
 9(3-4), 281-7
 CODEN: JPSODZ; ISSN: 0378-7753
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 ED Entered STN: 12 May 1984

AB The development and the electrochem. of laboratory prototype Li/S button cells is described. The cell consists of a Li anode, a porous catalytic current collector which is loaded with S, and an organic solvent containing Li polysulfide. The case of the cell was made from stainless steel and sealing was accomplished by the use of a combination of organic elastomer and cement (with no crimping). After 3 wk storage at 60°, the button cells lost only .apprx.1 mg of weight. The Li polysulfide reacts with the Li anode to form a passivating layer which acts as a solid electrolyte interphase. The electromotive force of the cells changes from 2.38 to 2.15 V depending on the composition of the solns. Cells exhibit flat discharge curves at low drains. The energy d. of the cells is 730 W-h/kg or 900 W-h/l at room temperature and 950 W-h/kg or 1200 W-h/L at 60° (calculated on the basis of all cell components, excluding the case). Storage and discharge tests at 60° show a capacity loss of 2-5% per mo depending on solution composition. This indicates a shelf life of at least 10 yr at room temperature

IT 109-99-9, uses and miscellaneous
 RL: USES (Uses)
 (lithium-sulfur battery with
 electrolyte from lithium perchlorate saturated
 with polysulfide dissolved in toluene)

RN 109-99-9 HCAPLUS
 CN Furan, tetrahydro- (CA INDEX NAME)



CC 72-3 (Electrochemistry)
 Section cross-reference(s): 52
 ST lithium sulfur nonaq battery
 IT Batteries, primary
 (button-type nonaq., lithium-sulfur)
 IT 7704-34-9, uses and miscellaneous

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RL: USES (Uses)
(cathode, in nonaq. button-type battery
with lithium)

IT 109-99-9, uses and miscellaneous

RL: USES (Uses)
(lithium-sulfur battery with
electrolyte from lithium perchlorate saturated
with polysulfide dissolved in toluene)

IT 7791-03-9

RL: PRP (Properties)
(lithium-sulfur battery with toluene-THF
containing polysulfide and)

IT 74432-42-1

RL: PRP (Properties)
(lithium-sulfur button-type battery with organic
solvent containing)

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FULL SEARCH HISTORY

=> d his nofile

(FILE 'HOME' ENTERED AT 09:24:53 ON 25 JUL 2008)

FILE 'HCAPLUS' ENTERED AT 09:25:13 ON 25 JUL 2008

E US20040185347/PN

L1 1 SEA ABB=ON PLU=ON US20040185347/PN
D ALL
SEL RN

FILE 'REGISTRY' ENTERED AT 09:26:11 ON 25 JUL 2008

L2 54 SEA ABB=ON PLU=ON (463-79-6/BI OR 10377-51-2/BI OR
105-58-8/BI OR 108-32-7/BI OR 108-88-3/BI OR 117-80-6/B
I OR 1192-62-7/BI OR 1193-79-9/BI OR 126-33-0/BI OR
127-63-9/BI OR 131651-65-5/BI OR 13243-65-7/BI OR
1330-20-7/BI OR 14024-11-4/BI OR 14283-07-9/BI OR
162684-16-4/BI OR 16851-82-4/BI OR 18424-17-4/BI OR
1889-59-4/BI OR 21324-40-3/BI OR 271-89-6/BI OR
27359-10-0/BI OR 28122-14-7/BI OR 28452-93-9/BI OR
29935-35-1/BI OR 33454-82-9/BI OR 35363-40-7/BI OR
3680-02-2/BI OR 37220-89-6/BI OR 39300-70-4/BI OR
4265-27-4/BI OR 4437-85-8/BI OR 462-06-6/BI OR
524-42-5/BI OR 5535-43-3/BI OR 5535-48-8/BI OR
56525-42-9/BI OR 616-38-6/BI OR 620-32-6/BI OR
623-53-0/BI OR 623-96-1/BI OR 625-86-5/BI OR 67-71-0/BI
OR 693-98-1/BI OR 71-43-2/BI OR 7439-93-2/BI OR
7447-41-8/BI OR 7474-83-1/BI OR 77-77-0/BI OR 7791-03-9
/BI OR 80-05-7/BI OR 90076-65-6/BI OR 95-15-8/BI OR
96-49-1/BI)
D SCAN

FILE 'STNGUIDE' ENTERED AT 09:27:20 ON 25 JUL 2008

FILE 'LREGISTRY' ENTERED AT 09:31:14 ON 25 JUL 2008

L3 STR

FILE 'REGISTRY' ENTERED AT 09:34:55 ON 25 JUL 2008

L4 50 SEA SSS SAM L3

FILE 'LREGISTRY' ENTERED AT 09:35:48 ON 25 JUL 2008

L5 STR L3

FILE 'REGISTRY' ENTERED AT 09:37:10 ON 25 JUL 2008

L6 50 SEA SSS SAM L5

FILE 'STNGUIDE' ENTERED AT 09:37:43 ON 25 JUL 2008

FILE 'REGISTRY' ENTERED AT 09:41:24 ON 25 JUL 2008

L7 SCR 1838
L8 SCR 2043
L9 50 SEA SSS SAM L3 AND L7 NOT L8
L10 SCR 2043 OR 1841
L11 50 SEA SSS SAM L3 AND L7 NOT L10
L12 SCR 2043 OR 1841 OR 1918
L13 50 SEA SSS SAM L3 AND L7 NOT L12
L14 SCR 2043 OR 1840 OR 1918
L15 50 SEA SSS SAM L3 AND L7 NOT L14
L16 50 SEA SSS SAM L5 AND L7 NOT L14
L17 SCR 2043 OR 1840 OR 1918 OR 1950
L18 50 SEA SSS SAM L5 AND L7 NOT L17
L19 SCR 2043 OR 1840 OR 1918 OR 1948
L20 SCR 2043 OR 1840 OR 1918 OR 1948
L21 50 SEA SSS SAM L5 AND L7 NOT L20
L22 28 SEA ABB=ON PLU=ON L2 AND 1-2/NR

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D SCAN

FILE 'STNGUIDE' ENTERED AT 09:50:42 ON 25 JUL 2008

FILE 'REGISTRY' ENTERED AT 09:52:57 ON 25 JUL 2008

L23 0 SEA ABB=ON PLU=ON L22 AND 3-9/N
 L24 0 SEA ABB=ON PLU=ON L22 AND 2-9/S
 L25 SCR 2043 OR 1840 OR 1918 OR 1948 OR 1994
 L26 50 SEA SSS SAM L3 AND L7 NOT L25
 L27 SCR 2043 OR 1840 OR 1918 OR 1948 OR 1994 OR 2016 OR 202
 L28 50 SEA SSS SAM L3 AND L7 NOT L27
 L29 SCR 2043 OR 1840 OR 1918 OR 1947 OR 1994 OR 2016 OR 202
 L30 50 SEA SSS SAM L3 AND L7 NOT L29
 L31 50 SEA SSS SAM L5 AND L7 NOT L29
 L32 STR L3
 L33 50 SEA SSS SAM L32 AND L7 NOT L29

FILE 'LREGISTRY' ENTERED AT 10:11:38 ON 25 JUL 2008

L34 STR L32

FILE 'REGISTRY' ENTERED AT 10:18:07 ON 25 JUL 2008

L35 50 SEA SSS SAM L34
 L36 50 SEA SSS SAM L34 AND L7 NOT L29
 L37 3 SEA ABB=ON PLU=ON L22 AND 3-9/O
 D SCAN
 D QUE L29
 L38 SCR 2043 OR 1840 OR 1918 OR 1947 OR 1994 OR 2016 OR 202
 L39 50 SEA SSS SAM L34 AND L7 NOT L38
 L40 278393 SEA SSS FUL L34 AND L7 NOT L38
 D SAV
 L41 10 SEA ABB=ON PLU=ON L2 AND L40
 SAV L40 WEI272REG/A

FILE 'LREGISTRY' ENTERED AT 10:31:09 ON 25 JUL 2008

L42 STR

FILE 'REGISTRY' ENTERED AT 10:40:57 ON 25 JUL 2008

L43 50 SEA SSS SAM L42
 L44 SCR 1839
 L45 SCR 1840 OR 2043 OR 1918
 L46 50 SEA SSS SAM L42 AND L44 NOT L45
 L47 11 SEA ABB=ON PLU=ON L2 AND 2/NR
 D SCAN
 D QUE STAT L46
 L48 3523 SEA SSS FUL L42 AND L44 NOT L45
 SAV TEMP L48 WEI272REGA/A

FILE 'STNGUIDE' ENTERED AT 10:47:57 ON 25 JUL 2008

FILE 'LREGISTRY' ENTERED AT 10:48:57 ON 25 JUL 2008

L49 STR

FILE 'REGISTRY' ENTERED AT 10:51:47 ON 25 JUL 2008

L50 50 SEA SSS SAM L49

FILE 'LREGISTRY' ENTERED AT 10:52:29 ON 25 JUL 2008

L51 STR L49

FILE 'REGISTRY' ENTERED AT 10:58:46 ON 25 JUL 2008

L52 33 SEA SSS SAM L51
 L53 12 SEA ABB=ON PLU=ON L2 AND ?SULFONE?/CNS
 D SCAN
 L54 16 SEA ABB=ON PLU=ON L2 AND 1-9/S
 L55 4 SEA ABB=ON PLU=ON L54 NOT L53
 D SCAN
 L56 SCR 1840 OR 2043
 L57 SCR 2005 AND 2021

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L58 50 SEA SSS SAM L51 AND L57 NOT L56
D QUE STAT
L59 SCR 1840 OR 2043 OR 2023 OR 1947 OR 1993 OR 2016 OR 202
L60 50 SEA SSS SAM L51 AND L57 NOT L59
L61 45053 SEA SSS FUL L51 AND L57 NOT L59
SAV L61 WEI272REGB/A

FILE 'HCAPLUS' ENTERED AT 11:14:36 ON 25 JUL 2008
D SCAN L1

FILE 'REGISTRY' ENTERED AT 11:14:36 ON 25 JUL 2008

L62 1 SEA ABB=ON PLU=ON 4265-27-4/RN
D SCAN
L63 1 SEA ABB=ON PLU=ON 80-05-7/RN
D SCAN
L64 1 SEA ABB=ON PLU=ON 95-15-8/RN
D SCAN

FILE 'HCAPLUS' ENTERED AT 11:19:23 ON 25 JUL 2008
D SCAN L1

FILE 'REGISTRY' ENTERED AT 11:19:24 ON 25 JUL 2008

L65 1 SEA ABB=ON PLU=ON L2 AND ?PYRROL?/CNS
D SCAN
D CN
L66 1 SEA ABB=ON PLU=ON 271-89-6/RN
D SCAN
L67 1 SEA ABB=ON PLU=ON 693-98-1/RN

FILE 'HCAPLUS' ENTERED AT 11:27:02 ON 25 JUL 2008
D SCAN L1

E "SECONDARY BATTERIES"/CT
L68 180074 SEA ABB=ON PLU=ON "SECONDARY BATTERIES"+MAX/CT
L69 85408 SEA ABB=ON PLU=ON BATTER?(2A) (SECONDAR? OR LITHIUM)
L70 199825 SEA ABB=ON PLU=ON L68 OR L69
E LITHIUM/CT 25
L71 52300 SEA ABB=ON PLU=ON LITHIUM(2A) (SALT OR HALIDE OR
ELECTROLYTE OR CATION OR ION)

FILE 'ZCAPLUS' ENTERED AT 11:36:16 ON 25 JUL 2008

L72 QUE ABB=ON PLU=ON ELECTROD?(2A) POSITIVE OR CATHOD?

FILE 'HCAPLUS' ENTERED AT 11:38:18 ON 25 JUL 2008

L73 QUE ABB=ON PLU=ON SOLVENT?(2A) (ORGANIC OR NONAQUEOUS
OR NON(W) AQUEOUS)
D QUE STAT L47
D QUE STAT L48

FILE 'REGISTRY' ENTERED AT 11:41:12 ON 25 JUL 2008

D QUE STAT L40
L74 90575 SEA ABB=ON PLU=ON L40 AND 1/NR
L75 187818 SEA ABB=ON PLU=ON L40 NOT L74
L76 186965 SEA ABB=ON PLU=ON L40 AND 2/NR
L77 155844 SEA ABB=ON PLU=ON L76 AND 1-99/N
L78 147343 SEA ABB=ON PLU=ON L76 AND 1-99/O
L79 119040 SEA ABB=ON PLU=ON L77 AND L78
L80 63851 SEA ABB=ON PLU=ON L76 AND 1-99/S
L81 37023 SEA ABB=ON PLU=ON L79 AND L80
L82 82017 SEA ABB=ON PLU=ON L79 NOT L81
L83 41097 SEA ABB=ON PLU=ON L76 NOT (L80 OR L81 OR L82)

FILE 'HCAPLUS' ENTERED AT 11:54:09 ON 25 JUL 2008

L84 580816 SEA ABB=ON PLU=ON L74 OR L80 OR L81 OR L82 OR L83
L85 26032 SEA ABB=ON PLU=ON L48
L86 5406 SEA ABB=ON PLU=ON L70 AND (L84 OR L85)
L87 628 SEA ABB=ON PLU=ON L86 AND L71 AND L73
D QUE

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L88 257 SEA ABB=ON PLU=ON L87 AND L72

FILE 'REGISTRY' ENTERED AT 12:02:02 ON 25 JUL 2008

L89 15 SEA ABB=ON PLU=ON L2 AND 1-9/LI
D SCAN

FILE 'STNGUIDE' ENTERED AT 12:02:38 ON 25 JUL 2008

FILE 'REGISTRY' ENTERED AT 12:04:40 ON 25 JUL 2008

FILE 'HCAPLUS' ENTERED AT 12:05:12 ON 25 JUL 2008

L90 QUE ABB=ON PLU=ON L89

L91 224 SEA ABB=ON PLU=ON L88 AND L90

FILE 'REGISTRY' ENTERED AT 12:05:34 ON 25 JUL 2008

FILE 'HCAPLUS' ENTERED AT 12:05:41 ON 25 JUL 2008
D SCAN L1

FILE 'REGISTRY' ENTERED AT 12:05:41 ON 25 JUL 2008

L92 1 SEA ABB=ON PLU=ON 7439-93-2/RN
D SCAN

L93 11 SEA ABB=ON PLU=ON L89 NOT (L92 OR TIS/CI)

L94 4 SEA ABB=ON PLU=ON L89 NOT L93
D SCAN

FILE 'HCAPLUS' ENTERED AT 12:07:51 ON 25 JUL 2008

L95 QUE ABB=ON PLU=ON L93

L96 207 SEA ABB=ON PLU=ON L88 AND L95
D SCAN L1
D QUE STAT L61

L97 QUE ABB=ON PLU=ON L61

L98 29 SEA ABB=ON PLU=ON L96 AND L97
E PASSIVATION/CT
E E3+ALL

L99 288810 SEA ABB=ON PLU=ON PASSIVATION+MAX/CT

L100 0 SEA ABB=ON PLU=ON L96 AND L99

L101 1 SEA ABB=ON PLU=ON L99 AND L88

L102 54756 SEA ABB=ON PLU=ON PASSIVAT?

L103 QUE ABB=ON PLU=ON FILM? OR THINFILM? OR LAYER? OR
OVERLAY? OR OVERLAID? OR LAMIN? OR LAMEL? OR MULTILAYER
? OR SHEET? OR LEAF? OR FOIL? OR COAT? OR TOPCOAT? OR
OVERCOAT? OR VENEER? OR SHEATH? OR COVER? OR ENVELOP?
OR ENCASE? OR ENWRAP? OR OVERSPREAD? OR ENCAPSUL?

L104 18876 SEA ABB=ON PLU=ON L102(3A)L103

L105 299911 SEA ABB=ON PLU=ON L99 OR L104

L106 3 SEA ABB=ON PLU=ON L105 AND L88
D SCAN

L107 10 SEA ABB=ON PLU=ON L105 AND L87

L108 10 SEA ABB=ON PLU=ON L101 OR L106 OR L107

L109 72122 SEA ABB=ON PLU=ON L63 OR BISPHENOL A

L110 46 SEA ABB=ON PLU=ON L65 AND PHENYLSULFONYL(A)PYRROLE

L111 2580 SEA ABB=ON PLU=ON L66 OR PHENYLSULFONYL(A)PYRROLE

L112 14059 SEA ABB=ON PLU=ON L67 OR BENZOFURAN

L113 16109 SEA ABB=ON PLU=ON L63 OR BUTYLBENZOFURAN

L114 869 SEA ABB=ON PLU=ON L65 OR THIANAPHTHENE

L115 15128 SEA ABB=ON PLU=ON L67 OR METHYLIMIDAZOLE OR METHYL(W)
IMIDAZOLE

L116 4607 SEA ABB=ON PLU=ON L70 AND L73
D QUE

L117 31 SEA ABB=ON PLU=ON L116 AND ((L109 OR L110 OR L111 OR
L112 OR L113 OR L114 OR L115))

L118 10 SEA ABB=ON PLU=ON L117 AND L95

L119 11 SEA ABB=ON PLU=ON L117 AND L71

L120 1 SEA ABB=ON PLU=ON L118 AND L105
D SCAN
D QUE L98

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D QUE L98
L121      5 SEA ABB=ON  PLU=ON  L117 AND L97
L122      0 SEA ABB=ON  PLU=ON  L98 AND L105
L123      5 SEA ABB=ON  PLU=ON  L117 AND L97
L124    73077 SEA ABB=ON  PLU=ON  L109 OR L113 OR L114
L125      24 SEA ABB=ON  PLU=ON  L124 AND L116
L126      10 SEA ABB=ON  PLU=ON  L125 AND (L71 OR L72 OR L95 OR
L105)
D QUE L98
L127      51 SEA ABB=ON  PLU=ON  L98 OR L108 OR (L118 OR L119 OR
L120 OR L121 OR L122 OR L123) OR L126
L128    777304 SEA ABB=ON  PLU=ON  ELECTROCHEM?/SC,SX
L129      48 SEA ABB=ON  PLU=ON  L127 AND L128
L130      33 SEA ABB=ON  PLU=ON  L129 AND L72
L131      QUE ABB=ON  PLU=ON  PY<2004 OR PRY<2004 OR AY<2004 OR
MY<2004 OR REVIEW/DT
L132      27 SEA ABB=ON  PLU=ON  L130 AND L131
SAV TEMP L132 WEI272HCP/A
D QUE
D QUE STAT L132
D L132 1-27 IBIB ED ABS HITSTR HITIND

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